

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

AIR QUALITY OPERATING PERMIT

Permit No.: 203TVP01
Application No.: 203
Revision 1: December 3, 2002
Administrative Revision: March 20, 2003

Issue Date: April 11, 2001
Expiration Date: April 10, 2006

The Department of Environmental Conservation, under the authority of AS 46.14 and 18 AAC 50, issues an operating permit to the permittee, **Anchorage Municipal Light & Power**, for the operation of the **George M. Sullivan Generation Plant Two**.

This permit satisfies the obligation of the owner and operator to obtain an operating permit as set out in AS 46.14.130(b).

As required by AS 46.14.120(c), the permittee shall comply with the terms and conditions of this operating permit.

As set out in 18 AAC 50.340(i), after the issue date of this permit, the permittee is no longer required to comply with the terms and conditions of Air Quality Control Permit to Operate No. 9421-AA014.

All terms and conditions of Air Quality Construction Permit No. 203CP01 have been incorporated into this Operating Permit. Under AS 14.290, the permittee is considered in compliance with applicable requirements of this Construction Permit to the extent allowed under U.S.C. 766c(f) (Clean Air Act, sec. 504(f)) by complying with this Operating Permit.

John F. Kuterbach, Manager
Air Permits Program

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List of Abbreviations Used in this Permit

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AS.....	Alaska Statutes
ASTM.....	American Society for Testing and Materials
C.F.R.	Code of Federal Regulations
COMS	Continuous Opacity Monitoring System
dscf.....	Dry standard cubic foot
EPA	US Environmental Protection Agency
gr./dscf.....	grain per dry standard cubic foot (1 pound = 7000 grains)
GPH.....	gallons per hour
HAPs	Hazardous Air Pollutants [hazardous air contaminants as defined in AS 46.14.990(14)]
ID.....	Source Identification Number
kPa.....	kiloPascals
MACT	Maximum Achievable Control Technology
NESHAPs.....	Federal National Emission Standards for Hazardous Air Pollutants [as defined in 40 C.F.R. 61]
NSPS	Federal New Source Performance Standards [as defined in 40 C.F.R. 60]
ppm.....	Parts per million
PS	Performance specification
PSD	Prevention of Significant Deterioration
RM.....	Reference Method
SIC.	Standard Industrial Classification
SO ₂	Sulfur dioxide
TPH.....	Tons per hour
TPY	Tons per year
VOC	volatile organic compound [as defined in 18 AAC 50.990(103)]
wt%.....	weight percent

Section 1. Identification**Names and Addresses**

Permittee: **Anchorage Municipal Light & Power**
1200 East First Avenue
Anchorage, Alaska 99501-1685

Facility: **George M. Sullivan Generation Plant Two**

Location: 61° 13' 48" North; 149° 43' 4" West

Physical Address: 8670 Glenn Highway
Anchorage, Alaska 99504

Owner: Municipality of Anchorage, d/b/a Anchorage ML&P
1200 East First Avenue
Anchorage , Alaska 99501-1685

Operator: Anchorage Municipal Light & Power
8670 Glenn Highway
Anchorage, Alaska 99504

Permittee's Responsible Official James M. Posey, General Manager

Designated Agent: Edward X. Ruebling, Generation Division Manager
1200 East First Avenue
Anchorage, Alaska 99501-1685

Facility and Building Contact: Robert Day, Acting Plant Two Superintendent
8670 Glenn Highway
Anchorage, Alaska 99504
(907) 263-5295

Fee Contact: Yelena Saville, Environmental Engineer
1200 East First Avenue
Anchorage, Alaska 99501-1685
(907) 263-5273

SIC Code of the Facility: 4911 Electric Service

[18 AAC 50.350(b), 1/18/97]

Section 2. General Emission Information

Emissions of Regulated Air Contaminants, as provided in the permittee's application:

Lead, nitrogen dioxide, carbon monoxide, sulfur dioxide, particulate matter (< 10 u), volatile organic compounds, oxides of nitrogen, 1,3 butadiene, acetaldehyde, antimony, acrolein, arsenic, benzene, beryllium, cadmium, chromium, cobalt, ethylbenzene, formaldehyde, manganese, mercury, naphthalene, nickel, phosphorus, selenium, toluene, isomers of xylene, hydrogen sulfide.

Operating Permit Classifications:

1. 18 AAC 50.325(b)(1)
2. 18 AAC 50.325(b)(3)
3. 18 AAC 50.325(c)

Facility Classifications as described under 18 AAC 50.300(b)-(f):

1. 18 AAC 50.300(b)(2)
2. 18 AAC 50.300(c)(1)
3. 18 AAC 50.300(c)(2)(A)
4. 18 AAC 50.300(d)

[18 AAC 50.350(b), 1/18/97]

Section 3. Fee Requirements

- 1. Assessable Emissions.** The permittee shall pay to the department annual emission fees based on the facility's assessable emissions as determined by the department under 18 AAC 50.410. The assessable emission fee rate is set out in 18 AAC 50.410. The department will assess fees per ton of each air contaminant that the facility emits or has the potential to emit in quantities greater than 10 tons per year. The quantity for which fees will be assessed is the lesser of

- 1.1 the facility's assessable potential to emit of 5132 tpy (4332 tons of NO_x, 59 tons of SO₂, 242.4 tons of CO, 354.6 tons of PM and 144 tons of VOC);or
- 1.2 the facility's projected annual rate of emissions that will occur from July 1 to the following June 30, based upon actual annual emissions emitted during the most recent calendar year or another 12 month period approved in writing by the department when demonstrated by
 - a. an enforceable test method described in 18 AAC 50.220;
 - b. material balance calculations
 - c. emission factors from EPA's publication AP-42, Vol. I, adopted by reference in 18 AAC 50.035; or
 - d. other methods and calculations approved by the department.

[18 AAC 50.350(c) & 18 AAC 50.400 – 420, 1/18/97]

- 2. Assessable Emissions Estimates.** Emission fees will be assessed as follows:

- 2.1 no later than March 31 of each year, the permittee may submit an estimate of the facility's assessable emissions to ADEC, Air Permits Program, ATTN: Assessable Emissions Estimate, 410 Willoughby Avenue, Suite 303, Juneau, Alaska, 99801-1795; the submittal must include all of the assumptions and calculations used to estimate the assessable emissions in sufficient detail so the department can verify the estimates; or
- 2.2 if no estimate is received on or before March 31 of each year, emission fees for the next fiscal year will be based on the potential to emit set out in condition 1.1.

[18 AAC 50.350(c) & 18 AAC 50.410, 1/18/97]

Section 4. Source Inventory and Description

Sources listed below have specific monitoring, record keeping, or reporting conditions in this permit. Source descriptions and ratings are given for identification purposes only.

TABLE 1 Source Inventory

ID	Source Name	Source Description	Rating/size	Install Date
1	GTG-5 Gas Turbine Generator	Westinghouse W-251-B2	480 MMBtu/hr	1975
2	GTG-7 Gas Turbine Generator	General Electric Frame 7 - PG7981	1,093 MMBtu/hr	1979
3	GTG-8 Gas Turbine Generator	General Electric Frame 7 - PG7111	1,136 MMBtu/hr	1984
5	Turbine Blackstart Unit 5	Cummins Model : QSK 19-C750	559 kW (750 BHP) @2100 RPM	2002
4*	Fuel Storage Tank # 2	Main Fuel Tank	1,000,000 gallons	1995

*Permit shield from some requirements granted in Section 11.

Section 5. Source-Specific Requirements**Diesel Fired Internal Combustion Engines***Visible Emissions*

3. The permittee shall not cause or allow visible emissions, excluding condensed water vapor, emitted from Source IDs 1 – 3 and 5 to reduce visibility through the exhaust effluent by greater than 20 percent for more than three minutes in any one hour.

Monitor, record and report according to Section 12.

[18 AAC 50.055(a)(1), 1/18/97; 18 AAC 50.350(d), 6/21/98; & 18 AAC 50.350(g) – (i), 1/18/97]

4. The permittee shall not cause or allow visible emissions, excluding condensed water vapor, emitted from Source ID 5 to reduce visibility through the exhaust effluent by greater than 20 percent averaged over any six consecutive minutes.

Monitor, record and report according to Section 12

[18 AAC 50.055(a)(1) & 50.346(c), 5/3/02]
[18 AAC 50.350(g) – (i), 1/18/97]

Particulate Matter

5. The permittee shall not cause or allow particulate matter emitted from Source IDs 1-3 and 5 to exceed 0.05 grains per cubic foot of exhaust gas corrected to standard conditions and averaged over three hours.

Monitor, record and report according to Section 12.

[18 AAC 50.055(b)(1), 1/18/97; 18 AAC 50.350(d), 6/21/98; & 18 AAC 50.350(g) – (i), 1/18/97]

Sulfur Compound Emissions

6. The permittee shall not cause or allow sulfur compound emissions, expressed as SO₂, from Source IDs 1 - 3 and 5 to exceed 500 ppm averaged over three hours.

[18 AAC 50.055(c), 1/18/97; 18 AAC 50.350(d), 6/21/98]

- 6.1 Use diesel fuel with a sulfur content of no more than 0.1 percent by weight in Source ID 3 and ID 5.

[Operating Permit No. 9421-AA014, 4/4/95]
[Construction Permit No. 203CP01 05/30/2002]

- 6.2 Diesel Fuel:

- a. Compliance with condition 6 is assured by using a grade of fuel that limits sulfur content to no more than 0.5 percent by weight, such as DF-1 or DF-2.

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- b. Obtain a certification of sulfur content for fuel shipments of 0.1% sulfur and a statement or receipt from the fuel supplier for any other fuel shipments received that certifies either the fuel sulfur content or that the fuel grade is DF-1 or DF-2. If a certificate is not available from the supplier, then analyze a representative sample of the fuel to be combusted to determine the sulfur content using ASTM method D129-00, D1266-98, D1552-95, D2622-98, D4294-98, D4045-99 or an alternative method approved by the department.
 - c. Report under condition 57 whenever fuel combusted does not meet the 0.1% requirement of condition 6.1 or the 0.5% requirement of condition 6.2a. The latter fuel sulfur content is the basis of the SO₂ potential to emit in condition 2.2. When reporting under this condition, include a material balance calculation of the sulfur compound emissions, in ppm of SO₂, expected from this fuel, using the equations in Section 14.
 - d. Report under condition 57 if a 3-hour exhaust concentration, calculated under condition 6.2c, exceeds 500 ppm of SO₂.
 - e. Record the fuel sulfur content or the fuel grade of each shipment required under condition 6.2b and record all material balance calculations required under condition 6.2c.
 - f. Attach copies of the records required by condition 6.2e with the facility operating reports required by condition 59.

[18 AAC 50.350(g)-(i), 1/18/97]

6.3 Fuel Gas:

- a. Compliance with this condition is assured by using a fuel gas that limits sulfur content to no more than 4000 ppm by volume measured as H₂S, i.e., H₂S concentration of less than or equal to 4000 ppm.
- b. Obtain a semiannual statement or receipt from the fuel supplier certifying the fuel gas H₂S concentration in ppm. If a certificate is not available from the supplier, then analyze a representative sample of the fuel semiannually to determine the sulfur content using 40 CFR 60, Appendix A, Method 11 or an alternative method approved by the department.
- c. Report under condition 57 whenever the H₂S concentration of the fuel gas obtained or analyzed exceeds 80 ppm. This H₂S concentration is the basis for the SO₂ potential to emit in condition 2.2.
- d. Record the H₂S concentration of the fuel gas required under condition 6.3b.
- e. Attach copies of the records required by condition 6.3d with the facility operating reports required by condition 59.

Volatile Organic Liquid Storage Vessels

7. For Source ID 4, the permittee shall keep readily accessible records for the life of the tank showing the dimensions and an analysis showing the capacity of the storage vessel.

[18 AAC 50.040(a)(2)(M), 7/2/00]

[Federal Citation: 40 C.F.R. 60.110(b)(c) & 40 C.F.R. 60.116(b)(a)-(b), 7/1/99]

Federal New Source Performance Standards, Subpart A (Source ID 3)

8. Maintain records of the occurrence and duration of any start-up, shutdown, or malfunction in the operation of Source ID 3, any malfunctions of associated air-pollution control equipment, and any periods during which a continuous monitoring system or monitoring device for Source ID 3 is inoperative.

[18 AAC 50.040(a)(1), 7/2/00]

[Federal Citation: 40 C.F.R. 60.7(b), 7/1/99]

9. The permittee shall notify the department and the EPA:

- 9.1 no later than 30 days after commencement of construction or reconstruction; and

[Federal Citation: 40 C.F.R. 60.7(a)(1), 7/1/99]

[18 AAC 50.040(a)(1), 7/2/00]

- 9.2 no more than 15 days after startup.

[Federal Citation: 40 C.F.R. 60.7(a)(3), 7/1/99]

[18 AAC 50.040(a)(1), 7/2/00]

10. **Good Air Pollution Control Practice.** At all times, including periods of startup, shutdown, and malfunction, the permittee shall, to the extent practicable, maintain and operate Source ID 3 including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the department which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance records, and inspections of Source ID 3.

[18 AAC 50.040(a)(1), 7/2/00]

[Federal Citation: 40 C.F.R. 60.11(d), 7/1/99]

11. For the purpose of submitting compliance certifications or establishing whether or not the permittee has violated or is in violation of the standard set forth in condition 13, nothing in this permit shall preclude the use, including the exclusive use, of any credible evidence or information, relevant to whether Source ID 3 would have been in compliance with applicable requirements if the appropriate performance or compliance test or procedure had been performed.

[18 AAC 50.040(a)(1), 7/2/00]

[Federal Citation: 40 C.F.R. 60.11(g), 7/1/99]

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- 12.** The permittee shall not build, erect, install, or use any article, machine, equipment or process, the use of which conceals an emission which would otherwise constitute a violation of a standard set forth in condition 13. Such concealment includes, but is not limited to, the use of gaseous diluents to achieve compliance with an opacity standard or with a standard that is based on the concentration of a pollutant in the gases discharged to the atmosphere.

[18 AAC 50.040(a)(1), 7/2/00]
[Federal Citation: 40 C.F.R. 60.12, 7/1/99]

Turbines Subject to NSPS Subpart GG (Source ID 3)

Nitrogen Oxide Emission Limit

- 13.** The corrected exhaust gas concentration of NO_x from Source ID 3 shall not exceed;

- a. 94 ppmvd when firing natural gas, or
- b. 92.2 ppmvd when firing diesel fuel.

[18 AAC 50.040(a)(2)(V), 7/2/00]
[Federal Citation: 40 CFR 60.332(a), 7/1/99]

- 13.2** To compute the nitrogen oxides emissions, permittee shall use analytical methods and procedures that are accurate to within 5 percent and are approved by the EPA Administrator to determine the nitrogen content of the fuel being fired.

[18 AAC 50.040(a)(2)(V), 7/2/00]
[Federal Citation: 40 CFR 60.335(a) & (e), 7/1/99]

- 13.3** Source ID 3 that is normally fired with natural gas is exempt from condition 13 when firing emergency fuel. Emergency fuel is fuel fired by a gas turbine only during circumstances such as natural gas supply curtailment or breakdown of delivery system that make it impossible to fire natural gas in the gas turbine.

[18 AAC 50.040(a)(2)(V), 7/2/00]
[Federal Citation: 40 CFR 60.331(r) & 60.332(k), 7/1/99]

- 13.4** Stationary gas turbines using water or steam injection for control of NO_x emissions are exempt from condition 13 when ice fog is deemed a traffic hazard by the owner or operator of the gas turbine.

[18 AAC 50.040(a)(2)(V), 7/2/00]
[Federal Citation: 40 CFR 60.332(f), 7/1/99]

- 14.** The permittee shall not exceed 75 MW of power output in Source ID 3 when the source operates in Lean-Lean (extended) mode.

- 14.1** Keep a log with records, once per hour for each hour that Source ID 3 operates indicating:

- a. megawatts power output

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- b. operating mode
 - c. operating time
 - d. date
- 14.2 Provide to the department a summary of megawatts power output, operating mode, and operating time upon request.
- 14.3 Report under condition 57 if the power output exceeds 75 MW when the source is operating in Lean-Lean extended mode.

[18 AAC 50.335(g), 1/18/97]
[18 AAC 50.350(g)-(i), 1/18/97]
[18 AAC 50.220(a)-(c), 1/18/97]
[Federal Citation: 40 CFR 60.8, 7/1/99]
[18 AAC 50.040(a)(1), 7/2/00]

Emissions Monitoring

- 15.** For new installation, current modification, or reconstruction of an affected facility turbine subject to 40 CFR § 60.332, conduct a source test for NO_x, SO₂, and O₂ per Section 8 for each source as set out in 40 CFR§60.8 and 40 CFR § 60.335 within 60 days after achieving the maximum production rate at which the unit will be operated, but no later than 180 days after initial startup.

[18 AAC 50.040(a)(1), 7/2/00]
[Federal Citation: 40 CFR 60.8, 7/1/99]

- 15.1 Notify the department and EPA at least 30 days in advance of the source test.

[18 AAC 50.040(a)(1), 7/2/00]
[Federal Citation: 40 CFR 60.8(d) and 60.11(e)(1); 7/1/99]

- 15.2 Conduct source tests and data reductions as set out in 40 CFR 60.8(b) and (f) and provide the department copies of any EPA administrator's waiver or approvals for alternative performance testing.

[18 AAC 50.040(a)(1), 7/2/00]
[Federal Citation: 40 CFR 60.8(b) and 60.8(f); 7/1/99]

- 15.3 Provide sampling ports and platform(s), safe access to platform(s), and utilities, and conduct testing as set out under 40 CFR 60.8(c) and (e).

[18 AAC 50.040(a)(1), 7/2/00]
[Federal Citation: 40 CFR 60.8(c) and 60.8(e), 7/1/99]

- 15.4 Furnish the department and EPA with a copy of the source test report per Section 8 and 40 CFR 60.8.

[Federal Citation: 40 CFR 60.8(a) and 60.11(e)(2) through (5), 7/1/99]
[18 AAC 50.040(a), 7/2/00, & 18 AAC 50.350(g)-(i), 1/18/97]

16. The permittee shall conduct a NO_x and O₂ source test, for Source ID 3, as set out in 40 CFR §60, Appendix A, Method 20 within 5 years of the issue date of this permit.

[18 AAC 50.350(g)-(i), 1/18/97]
[18 AAC 50.220(a)-(c), 1/18/97]
[Federal Citation: 40 CFR 60.8, 7/1/99]
[18 AAC 50.040(a)(1), 7/2/00]

17. The permittee shall not burn fuel with a sulfur content that exceeds 0.8 percent by weight.

[18 AAC 50.040(a)(2)(V), 7/2/00]
[Federal Citation: 40 CFR 60.333(b), 7/1/99]

18. Permittee shall monitor sulfur content and nitrogen content of the fuel being fired in the turbine.

18.1 The frequency of determination of the sulfur content and nitrogen content of the fuel shall be as follows: (1) If the turbine is supplied its fuel from a bulk storage tank, the values shall be determined on each occasion that fuel is transferred to the storage tank from any other source, (2) If the turbine is supplied its fuel without intermediate bulk storage the values shall be determined and recorded daily. Owners, operators or fuel vendors may develop custom schedules for determination of the values based on the design and operation of the affected facility and the characteristics of the fuel supply. These custom schedules shall be substantiated with data and must be approved by the EPA Administrator before they can be used to comply with conditions 13 or 17.

[18 AAC 50.040(a)(2)(V), 7/2/00]
[Federal Citation: 40 CFR 60.334(b)(1) & (2), 7/1/99]

- a. The sulfur content of the fuel shall be determined using ASTM D 2880-71 for liquid fuels and ASTM D 3031-81, D 4084-82, or D 3246-81 for gaseous fuels.

[18 AAC 50.040(a)(2)(V), 7/2/00]
[Federal Citation: 40 CFR 60.335(d), 7/1/99]
[18 AAC 50.350(g), 1/18/97]

- b. Report per condition 57 any daily period during which the sulfur content of the fuel being fired exceeds 0.8 percent.

[Federal Citation: 40 CFR 60.7(c) & 60.334(b)(2), 7/1/99]
[18 AAC 50.350(i), 7/2/00]

The EPA Administrator approved the following alternative monitoring schedule on February 14, 1997. Applies to the stationary gas turbines, Source ID 3, operated by Anchorage Municipal Light & Power; applies only during use of pipeline quality natural gas and does not alter any of the other requirements of NSPS Subparts A and GG.

19. The permittee shall monitor the sulfur content of the natural gas at least semiannually by ASTM method D4810-88. The EPA approved this analytical method on October 16, 1997.

19.1 Nitrogen monitoring shall be waived for pipeline quality natural gas.

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- 19.2 The permittee shall maintain records at the facility for at least 5 years from the generation of:
- a. all sulfur monitoring data,
 - b. documenting a constant supplier of source fuel, a substantial change in fuel quality shall be considered as a change in fuel supply, and
 - c. all turbine operation on fuels other than pipeline quality natural gas.
- 19.3 The permittee shall report semi-annually results of all sulfur monitoring data to the EPA.
- 19.4 The permittee shall report any changes in supplier or source of fuel within 60 days of such a change to the EPA.

[18 AAC 50.350(g) - (i), 1/18/97]

[Federal Citation: 40 CFR 660.334(b)(2), 7/1/99]

- 20.** Report per condition 57 when the emission limits in 13 or 17 are exceeded.

[18 AAC 50.350(i), 7/2/00]

[18 AAC 50.040(a)(2)(V), 7/2/00]

[Federal Citation: 40 C.F.R. 60.333(a) & (b), 7/1/99]

Water Injection for Control of Nitrogen Oxide Emissions (Source ID 3)

- 21.** The permittee shall use water injection when burning diesel fuel in Source ID 3 at the rate of 0.19 lb water/lb fuel when power output is greater than 30 MW; and 0.43 lb water/lb fuel when power output is greater than 63 MW.

[18 AAC 50.350(d)(1)(D), 1/18/97]

[Operating Permit No. 9421-AA014, 4/4/95]

- 21.1 Condition 21 does not apply to Source ID 3 when firing emergency fuel as described in condition 13.3.
- 21.2 Reduce the water-to-fuel ratio data to a 1-hour average, commencing on the hour, and the average shall be computed from 4 or more data points equally spaced over each 1-hour period for Source ID 3.
- 21.3 Periods of excess NO_x emissions shall be reported under condition 57, for any 1-hour period during which the average water-to-fuel ratio falls below the ratio specified in condition 21.
- 21.4 Report the 1-hour maximum, minimum, and average monthly water-to-fuel ratios with the facility operating report required by condition 59

[18 AAC 50.350(g-i), 1/18/97]

[Federal Citation: 40 C.F.R. 60.7(c), 9/15/94]

[Federal Citation: 40 C.F.R. 60.334(c)(1), 1/27/82]

- 22.** When using water injection to control NO_x emissions permittee shall install and operate a continuous monitoring system to monitor and record the fuel consumption and the ratio of water to fuel being fired in the turbine.

[Federal Citation: 40 C.F.R. 60.335(c)(2), 7/1/99]

[18 AAC 50.040(a)(2)(V), 7/2/00]

[18 AAC 50.350(g), 1/18/97]

- 22.1 This system shall be accurate to within ± 5.0 percent and shall be approved by the EPA Administrator.

- 22.2 The monitoring device shall be used to determine the fuel consumption and the water-to-fuel ratio at 30, 50, 75, and 100 percent of peak load or at four points in the normal operating range of the gas turbine, including the minimum point in the range and peak load. All loads shall be corrected to ISO conditions using the equation in 40 CFR 60.335(c)(1) or the appropriate equations supplied by the manufacturer.

[Federal Citation: 40 CFR 60.335(c)(2), 7/1/99]

[18 AAC 50.040(a)(2)(V), 7/2/00]

[18 AAC 50.350(g), 1/18/97]

- 23.** The permittee shall use 40 CFR 60, Appendix A, Method 20 to determine the nitrogen oxides and oxygen concentrations. The span values shall be 300 ppm of nitrogen oxide and 21 percent oxygen. The NO_x emissions shall be determined at each of the load conditions specified in condition 22.2.

[Federal Citation: 40 CFR 60.335(c)(3), 7/1/99]

[18 AAC 50.040(a)(2)(V), 7/2/00]

- 23.1 To meet the requirements of conditions 13 or 17 the owner or operator shall use the methods specified in condition 13.2 to determine the nitrogen and sulfur contents of the fuel being burned.

- 23.2 The analysis may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency.

[18 AAC 50.040(a)(2)(V), 7/2/00]

[40 C.F.R. 60.332(a), 7/1/99]

[Federal Citation: 40 C.F.R. 60.334(a) & 335(a)-(f), 7/1/99]

- 24.** If a continuous monitoring system (CMS, CEMS, PEMS) or monitoring device for water to fuel ratio was installed, the permittee shall submit an excess emissions and monitoring systems performance report (excess emissions are defined below) and/or a summary report in the format of Figure 1 (see conditions 25.5a & b) below to the EPA Administrator quarterly. Or the EPA Administrator, on a case-by-case basis, may determine that more frequent reporting is necessary to accurately assess the compliance status of the source. All reports shall be postmarked by the 30th day following the end of each calendar quarter.

[18 AAC 50.040(a)(1), 7/2/00]

[Federal Citation: 40 CFR 60.7(d), 7/1/99]

- 24.1 For the purpose of reports required under condition 20, periods of excess emissions that shall be reported are defined as follows:

- a. Nitrogen oxides. Any one-hour period during which the average NO_x concentration exceeds the condition 13 limits, or the water-to-fuel ratio, as measured by the continuous monitoring system, falls below the water-to-fuel ratio determined to demonstrate compliance with condition 13 or any period during which the fuel-bound nitrogen of the fuel is greater than the maximum nitrogen content allowed by the fuel-bound nitrogen allowance used during the most recent source test. Each report shall include the one-hour NO_x concentration, average water-to-fuel ratio, average fuel consumption, ambient conditions, gas turbine load, and nitrogen content of the fuel during the period of excess emissions, and the analytical method used to determine the fuel's nitrogen content.

[Federal Citation: 40 CFR 60.334(c)(1), 7/1/99]

[18 AAC 50.040(a)(2)(V), 7/2/00]

[18 AAC 50.350(g), 1/18/97]

- b. Sulfur dioxide. Any daily period during which the sulfur content of the fuel being fired in the gas turbine exceeds 0.8 percent.

[Federal Citation: 40 CFR 60.334(c)(2), 7/1/99]

[18 AAC 50.040(a)(2)(V), 7/2/00]

- c. Emergency fuel. Each period during which an exemption provided in condition 13.3 is in effect shall be included in the report required in condition 20. For each period, the type, reasons, and duration of the firing of the emergency fuel shall be reported.

[18 AAC 50.040(a)(2)(V), 7/2/00]

[Federal Citation: 40 CFR 60.334(c)(4), 7/1/99]

25. The written excess emission report shall contain the following information:

- 25.1 The magnitude of excess emissions shall be computed as 1-hour averages computed from four or more data points equally spaced over each 1-hour period. Data recorded during periods of continuous monitoring system breakdowns, repairs, calibration checks, and zero and span adjustments shall not be included in the data averages computed under this paragraph. An arithmetic or integrated average of all data may be used. The data may be recorded in reduced or non-reduced form (e.g., ppm pollutant and percent sulfur or fuel to water ratio). All excess emissions shall be converted into units used in conditions 13 or 17. After conversion into units of those conditions, the data may be rounded to the same number of significant digits as used in those conditions. Any conversion factor(s) used, and the date and time of commencement and completion of each time period of excess emissions shall be recorded. The process operating time during the reporting period shall be noted as well.

[18 AAC 50.040(a)(1), 7/2/00]

[Federal Citation: 40 CFR 60.7(c)(1) & 60.13(h), 7/1/99]

- 25.2 Specific identification of each period of excess emissions that occurs during startups, shutdowns, and malfunctions of the affected facility. The nature and cause of any malfunction (if known), the corrective action taken or preventative measures adopted.

[18 AAC 50.040(a)(1), 7/2/00]
[Federal Citation: 40 CFR 60.7(c)(2), 7/1/99]

- 25.3 The date and time identifying each period during which the continuous monitoring system was inoperative except for zero and span checks and the nature of the system repairs or adjustments.

[18 AAC 50.040(a)(1), 7/2/00]
[Federal Citation: 40 CFR 60.7(c)(3), 7/1/99]

- 25.4 When no excess emissions have occurred or the continuous monitoring system(s) have not been inoperative, repaired, or adjusted, such information shall be stated in the report.

[18 AAC 50.040(a)(1), 7/2/00]
[Federal Citation: 40 CFR 60.7(c)(4), 7/1/99]

- 25.5 The summary report form shall contain the information and be in the format shown in Figure 1 unless otherwise specified by the EPA Administrator. One summary report form shall be submitted for each pollutant monitored at each affected facility.

- a. if the total duration of excess emissions for the reporting period is less than 1 percent of the total operating time for the reporting period and CMS downtime for the reporting period is less than 5 percent of the total operating time for the reporting period, only the summary report form shall be submitted and the excess emission report described in Figure 1 need not be submitted unless requested by the EPA Administrator.
- b. if the total duration of excess emissions for the reporting period is 1 percent or greater of the total operating time for the reporting period or the total CMS downtime for the reporting period is 5 percent or greater of the total operating time for the reporting period, the summary report form and excess emission report described in Figure 1 shall both be submitted.

[18 AAC 50.040(a)(1), 7/2/00]
[Federal Citation: 40 CFR 60.7(d), 7/1/99]

Figure 1--Summary Report -- Excess Emission and Monitoring System PerformancePollutant (Circle One—SO₂/NO_x/fuel sulfur/fuel-to-water ratio)

Reporting period dates:

From _____ to _____

Company: _____

Emission Limitation _____

Address: _____

Monitor Manufacturer and Model No. _____

Date of Latest CMS Certification or Audit _____

Process Unit(s) Description: _____

Total source operating time in reporting period¹ _____

Emission data summary¹	CMS performance summary¹
1. Duration of excess emissions in reporting period due to:	1. CMS downtime in reporting period reporting period due to:
a. Startup/shutdown _____	a. Monitor equipment malfunctions _____
b. Control equipment problems _____	b. Non-Monitor equipment malfunctions _____
c. Process problems _____	c. Quality assurance calibration _____
d. Other known causes _____	d. Other known causes _____
e. Unknown causes _____	e. Unknown causes _____
2. Total duration of excess emission _____	2. Total CMS Downtime _____
3. Total duration of excess emissions X (100) [Total source operating time] _____ % ²	3. [Total CMS Downtime] X (100) [Total source operating time] _____ % ²

¹ Record all times in hours.

² For the reporting period: If the total duration of excess emissions is 1 percent or greater of the total operating time or the total CMS downtime is 5 percent or greater of the total operating time, both the summary report form and the excess emission report described in this condition shall be submitted.

25.6 On a separate page, describe any changes since last quarter in CMS, process or controls.

25.7 Certify this report under condition 53.

[18 AAC 50.040(a)(1), 7/2/00 & 18 AAC 50.205, 1/18/97]
[Federal Citation: 40 CFR 60.7(c) & (d), 7/1/99]

26. For Source ID 3 attach to the operating report required by condition 59 a copy of each quarterly excess emission and monitoring systems performance report under condition 24.

[18 AAC 50.040(a)(1), 7/2/00]
[Federal Citation: 40 CFR 60.7(c), 7/1/99]

Source ID 3 and Source ID 5 Operational Limits

- 27.** Limit the cumulative hours of operation for Source ID 5 not to exceed 300 hours per 12 months rolling period.

[Construction Permit No. 203CP01, 8/8/2002
]

- 27.1 Monitor and record the hours of operation for Source ID 5. Record the date, time and duration in hours of operation of Source ID 5. Calculate and record the cumulative 12-month rolling total hours of operations.
- 27.2 Report in the operation report as required in Section 8, the 12-month rolling period total hours of operation for Source ID 5.
- 28.** The permittee shall not exceed 185 tons of CO emissions in Source ID 3 per consecutive twelve-month period.

[18 AAC 50.350(d)(1)(D), 1/18/97]
[Operating Permit No. 9421-AA014, 4/4/95]

- 28.1 To verify the CO mass emission versus load correlation as set out in Condition 28.7a, conduct an initial CO emission source test on Source ID 3 while burning natural gas before December 31, 2002. This in accordance with Section 8 and 9; use Method 10, 40 CFR 60 Appendix A. Determine the load specific emission factor for Source ID 3.
- 28.2 During the CO emission source test, include a minimum of 5 different loads. The loads shall include the minimum load and the peak load within the normal operating range of the turbine. Determine the load specific emission factor consistent with Condition 28.3
- 28.3 During the CO emission test determine the exhaust gas flow rate of the source using either Method 1-4 or Method 19, 40 CFR 60 Appendix A.
- a. Measure and record the following turbine operational parameters during the tests, in accordance with the permittee standard operational practices. List each of the parameters, the relative humidity of the intake air, and the intake air temperature of the turbine shall be measured and recorded during the tests.
- b. Measure and record the fuel consumption rate during the tests.
- 28.4 The unit must be equipped with a dedicated fuel flow meter, accurate to +/- 5 percent error. Attach a copy of the fuel meter calibration results to the emission report.

-
- 28.5 For the fuel gas, used during the source testing, obtain a statement or receipt from the fuel gas supplier certifying the Higher Heating Value (HHV) of the used, according the A.G.A.-8 Test Method. If a certificate is not available from the gas supplier, then analyze a representative sample of the fuel gas to determine the HHV according the A.G.A.-8 Method, or an alternative method approved by the department. Attach a copy of the fuel analysis to the emissions report.
- 28.6 For Source ID 3 burn only fuel gas.
- [Construction Permit 203CP01, 8/8/2002]
- 28.7 Determine the CO mass emission for Source ID 3, for each hourly period, using the corresponding hourly Power production log; obtained from the control room operator log's; and by calculating the highest hourly CO emission value obtained from the estimating methods a and b
- a. hourly CO mass emissions in pounds using the formula
$$\text{CO (lb/hr)} = 10^{3.0305 - 0.0512 * (\text{MW Load})},$$
- [Operation Permit 203TVP01, 04/11/2001]
- b. the representative hourly CO emissions in pounds using greater of the two load-based CO emission factors determined under Condition 28.2, that bounds the given hourly average load.
- [Construction Permit 203CP01, 05/30/2002]
- 28.8 For each month, calculate the previous consecutive 12-month period of CO emissions, based on the sum of the hourly emissions calculations under Condition 28.7.
- 28.9 For each month of the operating report, include the calculated previous consecutive 12-month period CO emissions of Source ID 3 with the facility operating report required by Condition 59.
- 28.10 Report under condition 57 if the calculated previous consecutive twelve-month period of CO emissions in a given month exceeds the limit in condition 28.
- [18 AAC 50.350(g-i), 1/18/97]
- 29.** The permittee shall not cause or allow Source ID 3 to exceed 10% opacity for more than three minutes in any one hour.
- [18 AAC 50.350(d)(1)(D), 1/18/97]
[Operating Permit No. 9421-AA014, 4/4/95]
- 29.1 Take corrective action if any visible emissions, exceeding 10%, are observed for more than three minutes in any one hour.
- 29.2 Maintain records of any incident exceeding 10% opacity and corrective actions taken, for at least 5 years.

29.3 Report under condition 57 incidents exceeding 10% opacity and corrective actions taken.

29.4 Report incidents and corrective actions taken with the facility operating report required by condition 59.

[18 AAC 50.350(g) – (i), 1/18/97]

30. The permittee shall burn natural gas as the primary fuel in Source ID 3 to control particulate matter and sulfur dioxide emissions.

[18 AAC 50.350(d)(1)(D), 1/18/97]

[Operating Permit No. 9421-AA014, 4/4/95]

30.1 Compliance with this condition is assured by complying with condition 28.6.

[18 AAC 50.350(g) – (i), 1/18/97]

Burning Used Turbine Oil in Sources

Caution: Compliance with the requirements of the following conditions will ensure compliance with the applicable requirements of 18 AAC 50. This permit does not ensure compliance with other applicable state or federal laws concerning management, use, or disposal of used oil.

31. The permittee shall not burn any used oil generated off site at the facility.

[18 AAC 50.055(b)(1), 6/21/98, & 18 AAC 50.110, 5/26/72]

31.1 Make available to the department, upon request, the used oil blending records for the facility.

[18 AAC 50.030, 1/1/00; & 18 AAC 50.110, 5/26/72]

[18 AAC 50.055(b)(1), 6/21/98]

[18 AAC 50.350(g) – (i), 1/18/97]

Section 6. Insignificant Sources

This section contains the requirements that the permittee identified under 18 AAC 50.335(q)(2) as applicable to insignificant sources at the facility. This section also specifies the testing, monitoring, reporting, and record keeping for insignificant sources that the department finds necessary to ensure compliance with the applicable requirements. Insignificant sources are not exempted from any air quality control requirement or federally enforceable requirement, except that the requirements of conditions 57 and 59 do not apply to this section.

As set out in 18 AAC 50.350(m), the shield of AS 46.14.290 does not apply to insignificant sources.

- 32.** The permittee shall not cause or allow visible emissions, excluding condensed water vapor, emitted from an industrial process, fuel-burning equipment, or an incinerator to reduce visibility through the exhaust effluent by greater than 20% for more than three minutes in any one hour.

[18 AAC 50.050(a)(2) & 18 AAC 50.055(a)(1), 1/18/97]

- 33.** The permittee shall not cause or allow particulate matter emitted from an industrial process or fuel-burning equipment to exceed 0.05 grains per cubic foot of exhaust gas corrected to standard conditions and averaged over three hours.

[18 AAC 50.055(b)(1), 1/18/97]

- 34.** The permittee shall not cause or allow sulfur compound emissions, expressed as SO₂, from an industrial process or fuel-burning equipment, to exceed 500 ppm averaged over three hours.

[18 AAC 50.055(c), 1/18/97]

- 35.** Based on reasonable inquiry, the permittee shall certify compliance with the requirements specified in conditions 32, 33, and 34 as set out in condition 60.

[18 AAC 50.350(m)(3), 9/4/98]

Section 7. Generally Applicable Requirements

- 36. Asbestos NESHAP.** The permittee shall comply with the requirements set forth in 40 C.F.R. 61.145, 61.150, and 61.152, and the applicable sections set forth in 40 C.F.R. 61, Subpart A and Appendix A.

[18 AAC 50.040(b)(3) & 18 AAC 50.350(d)(1), 1/18/97]

[Federal Citation: 40 C.F.R. 61, Subpart M, 12/19/96]

- 37. Refrigerant Recycling and Disposal.** The permittee shall comply with the standards for recycling and emission reduction of refrigerants set forth in 40 C.F.R. 82, Subpart F.

[18 AAC 50.040(d) & 18 AAC 50.350(d)(1), 1/18/97]

[Federal Citation: 40 C.F.R. 82, Subpart F, 7/1/97]

- 38. Facilities Containing NSPS Sources.** The permittee shall comply with the requirements of 40 C.F.R. 60, New Source Performance Standards (NSPS), 40 C.F.R. 61 National Emission Standards for Hazardous Air Pollutants (NESHAPS), 40 C.F.R. 63, National Emission Standards for Hazardous Air Pollutants (NESHAPS) for Source Categories as they apply to the facility.

[18 AAC 50.040(a) & (c), 7/2/00; 18 AAC 50.040(b), 1/18/97]

- 39. Dilution.** The permittee shall not dilute emissions with air to comply with this permit.

[18 AAC 50.045(a), 1/18/97]

39.1 Check all ductwork and exhaust systems for leaks, and repair any leaks found

- a. no sooner than 30 days prior to conducting a source test to demonstrate compliance with this permit,
- b. once during the first six months of this permit and every 17,520 hours of source operation thereafter for sources subject to visible emission observations conducted pursuant to Section 12, or
- c. once during the life of this permit for any other source regulated by this permit.

[18 AAC 50.350(g) & 18 AAC 50.350(f)(3), 1/18/97]

39.2 Keep records of all inspections and repairs performed under this condition.

[18 AAC 50.350(h) & 18 AAC 50.350(f)(3), 1/18/97]

39.3 Upon request of the department, submit copies of the records.

[18 AAC 50.350(i) & 18 AAC 50.350(f)(3), 1/18/97]

- 40. Stack Injection.** The permittee shall not release materials other than process emissions, products of combustion, or materials introduced to control pollutant emissions from a stack at a source constructed or modified after November 1, 1982, unless approved in writing by the department.

[18 AAC 50.055(g) & 18 AAC 50.310(m), 1/18/97]

41. Open Burning. The permittee shall not conduct open burning at the facility.

[18 AAC 50.350(f)(4), 1/18/97]

42. Air Pollution Prohibited. The permittee shall not cause any emission which is injurious to human health or welfare, animal or plant life, or property, or which would unreasonably interfere with the enjoyment of life or property.

[18 AAC 50.040(e), 7/2/00, 1/18/97; 18 AAC 50.110, 5/26/72; & 18 AAC 50.350(d)(1), 1/18/97]

42.1 Within 24 hours of receiving a complaint that is attributable to emissions from the facility, investigate the complaint and take reasonable actions to alleviate or eliminate the cause of the complaint.

[18 AAC 50.240(c) & 18 AAC 50.350(g), 1/18/97]

42.2 Keep records of the date, time, and nature of all complaints received and summary of the investigation and corrective actions undertaken for complaints attributable to emissions from the facility. Upon request of the department, submit copies of the records.

[18 AAC 50.350(h) – (i), 1/18/97]

43. Technology-Based Emission Standard. If an unavoidable emergency, malfunction, or non-routine repair, as defined in 18 AAC 50.235, causes emissions in excess of a technology-based emission standard listed in conditions 13, 17, or 37, the permittee shall take all reasonable steps to minimize levels of emissions that exceed the standard.

[18 AAC 50.235(a) & 18 AAC 50.350(f), 1/18/97]

44. Permit Renewal. To renew this permit, the permittee shall submit a complete application under 18 AAC 50.335 no sooner than **October 10, 2004**, and no later than **October 10, 2005**, to renew this permit.

[18 AAC 50.335(a), 1/18/97]

Section 8. General Source Testing and Monitoring Requirements

- 45. Requested Source Tests.** In addition to any source testing explicitly required by this permit, the permittee shall conduct source testing as requested by the department to determine compliance with applicable permit requirements.

[18 AAC 50.220(a), 18 AAC 50.345(a)(10), 1/18/97]

- 46. Operating Conditions.** Unless otherwise specified by an applicable requirement or test method, the permittee shall conduct source testing

46.1 At a point or points that characterize the actual discharge into the ambient air; and

46.2 At the maximum rated burning or operating capacity of the source or another rate determined by the department to characterize the actual discharge into the ambient air.

[18 AAC 50.220(b) & 18 AAC 50.350(g), 1/18/97]

- 47. Reference Test Methods.** The permittee shall use the following as reference test methods when conducting source testing for compliance with this permit:

47.1 Source testing for compliance with requirements adopted by reference in 18 AAC 50.040(a) must be conducted in accordance with the methods and procedures specified in 40 C.F.R. 60.

[18 AAC 50.040(a), 7/2/00, 18 AAC 50.220(c)(1)(A) & 18 AAC 50.350(g), 1/18/97]
[Federal Citation: 40 C.F.R. 60, 7/1/99]

47.2 Source testing for compliance with requirements adopted by reference in 18 AAC 50.040(b) must be conducted in accordance with the methods and procedures specified in 40 C.F.R. 61.

[18 AAC 50.040(b), 18 AAC 50.220(c)(1)(B) & 18 AAC 50.350(g), 1/18/97]
[Federal Citation: 40 C.F.R. 61, 7/1/97]

47.3 Source testing for compliance with requirements adopted by reference in 18 AAC 50.040(c) must be conducted in accordance with the source test methods and procedures specified in 40 C.F.R. 63.

[18 AAC 50.040(c), 18 AAC 50.220(c)(1)(C) & 18 AAC 50.350(g), 1/18/97]
[Federal Citation: 40 C.F.R. 63, 7/1/97]

47.4 Source testing for the reduction in visibility through the exhaust effluent must be conducted in accordance with the procedures set out in Section 13.

[18 AAC 50.030, 18 AAC 50.220(c)(1)(D) & 18 AAC 50.350(g), 1/18/97]

47.5 Source testing for emissions of particulate matter, sulfur compounds, nitrogen compounds, carbon monoxide, lead, volatile organic compounds, fluorides, sulfuric acid mist, municipal waste combustor organics, metals, and acid gases must be conducted in accordance with the methods and procedures specified 40 C.F.R. 60, Appendix A.

[18 AAC 50.040(a)(4), 7/2/00 18 AAC 50.220(c)(1)(E) & 18 AAC 50.350(g), 1/18/97]
[Federal Citation: 40 C.F.R. 60, Appendix A, 7/1/99]

47.6 Source testing for emissions of PM-10 must be conducted in accordance with the procedures specified in 40 C.F.R. 51, Appendix M.

[18 AAC 50.035, 18 AAC 50.220(c)(1)(F) & 18 AAC 50.350(g), 1/18/97]
[Federal Citation: 40 C.F.R. 51, Appendix M, 7/1/97]

47.7 Source testing for emissions of any contaminant may be determined using an alternative method approved by the department in accordance with Method 301 in Appendix A to 40 C.F.R. 63.

[18 AAC 50.040(c), 7/2/00, 18 AAC 50.220(c)(2) & 18 AAC 50.350(g), 1/18/97]
[Federal Citation: 40 C.F.R. 63, Appendix A, Method 301, 7/1/99]

48. **Excess Air Requirements.** To determine compliance with this permit, standard exhaust gas volumes must only include the volume of gases formed from the theoretical combustion of fuel, plus the excess air volume normal for the specific source type, corrected to standard conditions (dry gas at 70° F and an absolute pressure of 760 millimeters of mercury).

[18 AAC 50.220(c)(3), 18 AAC 50.350(g) & 18 AAC 50.990(88), 1/18/97]

49. **Test Plans.** Before conducting any source tests, the permittee shall submit a plan to the department. The plan must include the methods and procedures to be used for sampling, testing, and quality assurance, and must specify how the source will operate during the test and how the permittee will document this operation. A complete plan must be submitted within 60 days of receiving a request under condition 45 and at least 30 days before the scheduled date of any tests.

[18 AAC 50.345(a)(10), 18 AAC 50.350(b)(3) & 18 AAC 50.350(g), 1/18/97]

50. **Test Notification.** At least 10 days before conducting a source test, the permittee shall give the department written notice of the date and time the source test will begin.

[18 AAC 50.345(a)(10) & 18 AAC 50.350(b)(3), 1/18/97]

51. **Test Reports.** Within 45 days after completing a source test, the permittee shall submit two copies of the results, to the extent practical, in the format set out in the *Source Test Report Outline* of Volume III, Section IV.3 of the State Air Quality Control Plan, adopted by reference in 18 AAC 50.030(8). The permittee shall certify the results as set out in condition 53.

[18 AAC 50.345(a)(10), 18 AAC 50.350(b)(3) & 18 AAC 50.350(h) – (i), 1/18/97]

52. **Particulate Matter Calculations.** In source testing for compliance with the particulate matter standards in conditions 5 and 33, the three-hour average is determined using the average of three one-hour test runs.

[18 AAC 50.220(f) & 18 AAC 50.350(g), 1/18/97]

Section 9. General Record Keeping, Reporting, and Compliance Certification Requirements

- 53. Certification.** The permittee shall certify all reports, compliance certifications, or other documents submitted to the department under this permit by including the signature of a responsible official for the permitted facility following the statement: “Based on information and belief formed after reasonable inquiry, I certify that the statements and information in and attached to this document are true, accurate, and complete.” For the same six-month reporting period, the excess emission and permit deviation reports submitted under condition 57 may be certified with the facility operating report required by condition 59. All other reports must be certified upon submittal.

[18 AAC 50.205, 18 AAC 50.345(a)(9), 18 AAC 50.350(b)(3) & 18 AAC 50.350(i) 1/18/97]

- 54. Submittals.** Unless otherwise directed by the department or this permit, the permittee shall send reports, compliance certifications, and other documents required by this permit to ADEC, Air Permits Program, 610 University Ave., Fairbanks, AK 99709-3643, ATTN: Compliance Technician.

[18 AAC 50.350(i), 1/18/97]

- 55. Information Requests.** The permittee shall furnish to the department, within a reasonable time, any information the department requests in writing to determine whether cause exists to modify, revoke and reissue, or terminate the permit or to determine compliance with the permit. Upon request, the permittee shall furnish to the department copies of records required to be kept by this permit. The department, in its discretion, will require the permittee to furnish copies of those records directly to the federal administrator.

[18 AAC 50.200, 18 AAC 50.345(a)(8), 18 AAC 50.350(b)(3) & 18 AAC 50.350(g) – (i), 1/18/97]

- 55.1 The permittee shall submit to the department the engine serial number for Source ID 5 30 days after initial installation.

[Construction Permit No. 203CP01]

- 56. Record Keeping Requirements.** The permittee shall keep all records required by this permit for at least five years after the date of collection, including:

- 56.1 Copies of all reports and certifications submitted pursuant to this section of the permit.

- 56.2 Records of all monitoring required by this permit, and information about the monitoring including

- a. calibration and maintenance records, original strip chart or computer-based recordings for continuous monitoring instrumentation;
- b. sampling dates and times of sampling or measurements;
- c. the operating conditions that existed at the time of sampling or measurement;

-
- d. the date analyses were performed;
 - e. the location where samples were taken;
 - f. the company or entity that performed the sampling and analyses;
 - g. the analytical techniques or methods used in the analyses; and
 - h. the results of the analyses.

[18 AAC 50.350(h), 1/18/97]

- 57. Excess Emission and Permit Deviation Reports.** The permittee shall report all emissions or operations that exceed or deviate from the requirements of this permit or that present a potential threat to human health or safety as soon as possible, but no later than 48 hours, after discovery of the event. The report must include the information listed on the form contained in Section 15. The permittee may use this form to report emissions under this condition.

[18 AAC 50.235(a)(2), 18 AAC 50.240(c) & 18 AAC 50.350(i), 1/18/97]

- 58. NSPS and NESHAP Reports.** The permittee shall submit to the department copies of reports required by conditions 19, 24, 25, and 36, as they apply to the facility as follows:

- 58.1 Attach a copy of any NSPS and NESHAPs reports submitted to the U.S. Environmental Protection Agency (EPA) Region 10 to the facility operating report required by condition 59.
- 58.2 The permittee shall notify the department and provide a written copy of any U.S. EPA granted waiver of the federal emission standards, record keeping, monitoring, performance testing, or reporting requirements, or approved custom monitoring schedules within 30 days after receipt of a waiver or schedule. Keep a copy of each U.S. EPA issued monitoring waiver or custom monitoring schedule with the permit at the facility.

[18 AAC 50.040, 7/2/00 & 18 AAC 350(i)(2), 1/18/97]

[Federal Citation 40 C.F.R. 60 & 40 C.F.R. 61, 7/1/99]

- 59. Facility Operating Reports.** During the life of this permit, the permittee shall submit an original and two copies of an operating report by August 1 for the period January 1 to June 30 and by February 1 for the period July 1 to December 31. Facility operating reports must include copies of the records required to be reported by the conditions of this permit. In addition, facility operating reports must include a listing of all excess emissions and permit deviations that occurred during the reporting period and must identify:

- 59.1 the date of the deviation;
- 59.2 the equipment involved;
- 59.3 the permit condition;

59.4 a description of the deviation; and

59.5 any corrective action or preventive measures taken and the date of such actions.

[18 AAC 50.350(d)(4), 18 AAC 50.350(f)(3) & 18 AAC 50.350(i), 1/18/97]

60. Annual Compliance Certification. Each year by February 1, the permittee shall compile and submit to the department an original and two copies of an annual compliance certification report as follows:

60.1 For each permit term and condition set forth in Section 3 through Section 9, including terms and conditions for monitoring, reporting, and record keeping:

[18 AAC 50.350(d)(4), 1/18/97]

- a. certify the compliance status over the preceding calendar year consistent with the monitoring required by this permit;
- b. state whether compliance is intermittent or continuous; and
- c. briefly describe each method used to determine the compliance status.

60.2 Submit a copy of the report directly to the U.S. EPA-Region 10, Office of Air Quality, M/S OAQ-107, 1200 Sixth Avenue, Seattle, WA 98101.

[18 AAC 50.350(d)(4) & 18 AAC 50.350(j), 1/18/97]

Section 10. Standard Conditions Not Otherwise Included in the Permit

- 61.** Consistent with Alaska law, for purpose of submitting compliance certifications or establishing whether or not the permittee has violated or is in violation of any standard in this permit, nothing in this permit precludes the use of any credible evidence or information relevant to whether the facility would have been in compliance with applicable requirements if the appropriate performance or compliance test or procedure had been performed. This condition is not federally enforceable.

[18 AAC 50.350(f)(3), 1/18/97]

- 62.** The permittee must comply with each permit term and condition. Noncompliance constitutes a violation of AS 46.14, 18 AAC 50, and the Clean Air Act, except for those requirements designated as not federally-enforceable, and is grounds for:

62.1 an enforcement action,

62.2 permit termination, revocation and re-issuance, or modification in accordance with AS 46.14.280, or

62.3 denial of an operating-permit renewal application.

[18 AAC 50.345(a)(1) & 18 AAC 50.350(b)(3), 1/18/97]

- 63.** It is not a defense in an enforcement action to claim that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with a permit term or condition.

[18 AAC 50.345(a)(2) & 18 AAC 50.350(b)(3), 1/18/97]

- 64.** Each permit term and condition is independent of the permit as a whole and remains valid regardless of a challenge to any other part of this permit.

[18 AAC 50.345(a)(3) & 18 AAC 50.350(b)(3), 1/18/97]

- 65.** Compliance with permit terms and conditions is considered to be compliance with those requirements that are:

65.1 included and specifically identified in the permit, or

65.2 determined in writing in the permit to be inapplicable.

[18 AAC 50.345(a)(4) & 18 AAC 50.350(b)(3), 1/18/97]

- 66.** The permit may be modified, reopened, revoked and reissued, or terminated for cause. A request by the permittee for modification, revocation and re-issuance, or termination or a notification of planned changes or anticipated noncompliance does not stay any operating permit condition.

[18 AAC 50.345(a)(5) & 18 AAC 50.350(b)(3), 1/18/97]

- 67.** The permit does not convey any property rights of any sort, nor any exclusive privilege.

[18 AAC 50.345(a)(6) & 18 AAC 50.350(b)(3), 1/18/97]

- 68.** The permittee shall allow an officer or employee of the department or an inspector authorized by the department, upon presentation of credentials and at reasonable times with the consent of the owner or operator, to:

68.1 enter upon the premises where a source subject to the operating permit is located or where records required by the permit are kept,

68.2 have access to and copy any records required by the permit,

68.3 inspect any facilities, equipment, practices, or operations regulated by or referenced in the permit, and

68.4 sample or monitor substances or parameters to assure compliance with the permit or other applicable requirements.

[18 AAC 50.345(a)(7) & 18 AAC 50.350(b)(3), 1/18/97]

Section 11. Permit As Shield from Inapplicable Requirements

In accordance with AS 46.14.290, this section of the permit contains the requirements determined by the department not to be applicable to the permitted facility.

- 69.** The department has determined that Source ID 4 is not subject to the requirements set forth in 40 C.F.R. 60 Subpart K and Ka. This determination is based upon certification by the permittee that Source ID 4 stores liquids with a vapor pressure less than 3.5 kPa.

[18 AAC 50.350(l), 1/18/97]

- 70.** The department has determined that Source IDs 1 -2 are not subject to the requirements set forth in 40 C.F.R. 60 Subpart GG. This determination is based upon certification by the permittee that Source IDs 1 -2 were installed before October 7, 1977 and have not been reconstructed or modified.

[18 AAC 50.350(l), 1/18/97]

- 71.** The department has determined that the facility is not subject to the requirements set forth in 40 C.F.R. 63. This determination is based upon certification by the permittee that applicable activities are not performed at the facility.

[18 AAC 50.350(l), 1/18/97]

Section 12. Visible Emissions and Particulate Matter Monitoring Plan**Visible Emissions Observations**

- 72.** Except as provided in condition 73, the permittee shall observe the exhaust of each source for visible emissions using the visible-emission plan in condition 72.1. For sources fired with natural gas, make an observation using Method-9 plan for each startup and each shutdown on each source. However, the frequency of the startup/shutdown observations for natural gas does not need to exceed the frequency in the plan below that the permittee has chosen to use.
- 72.1 Method-9 Plan.** Within six months after the issue date of this permit, and at least once every 1000 hours (4380 hours for natural gas) that each Source IDs 1-3 and 7, operates thereafter, observe its exhaust for six minutes to obtain 24 individual 15-second opacity readings in accordance with Section 13.
- a. If two or more individual 15-second readings during the six-minute observation period are greater than 20% opacity, then continue the Method-9 observations for an additional 12 minutes for a total of 18 minutes.
 - b. If four or more individual 15-second readings during the 18-minute observation period are greater than 20% opacity, then continue the Method-9 observations for an additional 42 minutes for a total of 60 minutes.
- 73.** The permittee may reduce the number of six-minute observations required by the Method-9 Plan (condition 72.1) to one observation for every 4380 hours (8760 hours for natural gas) of source operation if:
- 73.1 60 minutes of observations were not necessary under condition 72.1b; or
 - 73.2 the source was observed for 60 minutes and no more than eight individual 15-second readings are greater than 20% opacity during the most recent observation.
- 74.** If a source is observed for 60 minutes and more than 8, but fewer than 13, 15-second readings are greater than 20% opacity during the most recent observation, then the observation frequency under the Method-9 Plan (condition 72.1) must be increased to or maintained at once every 1000 hours (4380 hours for natural gas) of source operation.
- 75.** The permittee is not required to comply with conditions 49, 50 and 51 (Test Plans, Test Notifications and Test Reports) when the exhaust is observed for visible emissions under conditions 72 – 74.

Corrective Actions Based on Method-9 Observations

76. If visible emissions exceed the 20 % opacity standard in the exhaust during a Method 9 Test performed under condition 72.1, then the permittee shall:

76.1 Take actions to eliminate visible emissions from the source within 24 hours of the observation;

76.2 Keep a written record of the starting date, the completion date, and a description of the actions taken to eliminate visible emissions;

76.3 Report under condition 57.

Reporting Requirements

77. Report under condition 57 if:

77.1 a 60 minute Method-9 reading results in 13 or more 15-seconds readings with an opacity greater than 20%;

77.2 a 6 minute Method 9 reading results in 2 or more 15-second readings with an opacity greater than 20%; or

77.3 the results of a test for particulate matter exceed the particulate matter emission limit.

[18 AAC 50.350(g) – (i), 1/18/97]

Section 13. Visible Emission Evaluation Procedures

An observer qualified according to 40 C.F.R. 60, RM 9 shall use the following procedures to determine the reduction of visibility through the exhaust effluent.

Position. The qualified observer shall stand at a distance sufficient to provide a clear view of the emissions with the sun oriented in the 140° sector to his back. Consistent with maintaining the above requirement, the observer shall, as much as possible, make his observations from a position such that his line of vision is approximately perpendicular to the plume direction and, when observing opacity of emissions from rectangular outlets (e.g., roof monitors, open baghouses, noncircular stacks), approximately perpendicular to the longer axis of the outlet. The observer's line of sight should not include more than one plume at a time when multiple stacks are involved, and in any case the observer should make his observations with his line of sight perpendicular to the longer axis of such a set of multiple stacks (e.g., stub stacks on baghouses).

Field Records. The observer shall record the name of the plant, emission location, facility type, observer's name and affiliation, and the date on the Visible Emissions Field Data Sheet. The time, estimated distance to the emission location, approximate wind direction, estimated wind speed, description of the sky condition (presence and color of clouds), and plume background are recorded on the sheet at the time opacity readings are initiated and completed.

Observations. Opacity observations shall be made at the point of greatest opacity in that portion of the plume where condensed water vapor is not present. The observer shall not look continuously at the plume but instead shall observe the plume momentarily at 15-second intervals. Unless directed to do otherwise in this permit, observe emissions for 60 consecutive minutes to obtain a minimum of 240 observations.

Attached Steam Plumes. When condensed water vapor is present within the plume as it emerges from the emission outlet, opacity observations shall be made beyond the point in the plume at which condensed water vapor is no longer visible. The observer shall record the approximate distance from the emission outlet to the point in the plume at which the observations are made.

Detached Steam Plume. When water vapor in the plume condenses and becomes visible at a distinct distance from the emission outlet, the opacity of emissions should be evaluated at the emission outlet prior to the condensation of water vapor and the formation of the steam plume.

Recording Observations. Opacity observations shall be recorded to the nearest 5 percent at 15-second intervals on the Visible Emissions Observation Record contained in this section. Record the minimum number of observations required by the permit. Each momentary observation recorded shall be deemed to represent the average opacity of emissions for a 15-second period.

Data Reduction. To determine compliance with a standard set out in conditions 3 and 32, count the number of observations that exceed 20 percent opacity and record this number on the sheet.

Visible Emissions Field Data Sheet

Certified Observer: _____

Company: _____

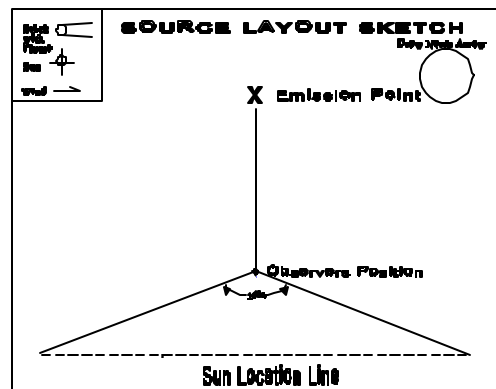
Location: _____

Test No.: _____ Date: _____

Source: _____

Production Rate, Operating Rate &
Unit Operating Hours: _____

Hrs. of observation: _____



Clock Time	Initial				Final
Observer location Distance to discharge					
Direction from discharge					
Height of observer point					
Background description					
Weather conditions Wind Direction					
Wind speed					
Ambient Temperature					
Relative humidity					
Sky conditions: (clear, overcast, % clouds, etc.)					
Plume description: Color					
Distance visible					
Water droplet plume? (Attached or detached?)					
Other information					

Visible Emissions Observation Record

Page ____ of ____

Company _____ Certified Observer _____

Test Number _____ Clock time _____

Date:		Visibility reduction every 15 Seconds (Opacity)				Steam Plume (check if applicable)		Comments
Hr	Min	0	15	30	45	Attached	Detached	

Additional information:

Observer Signature
Data Reduction:

Duration of Observation Period (minutes) _____

Number of Observations _____

Number of Observations exceeding 20% _____

Average Opacity Summary

Set Number	Time Start—End	Opacity	
		Sum	Average

Section 14. Material Balance Calculation

If the sulfur content of a fuel shipment is greater than 0.5% by weight, calculate the three-hour exhaust concentration of SO₂ using the following equations:

$$A = 31,200 \times [\text{wt}\%S_{\text{fuel}}] = 31,200 \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$B = 0.148 \times [\text{wt}\%S_{\text{fuel}}] = 0.148 \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$C = 0.396 \times [\text{wt}\%C_{\text{fuel}}] = 0.396 \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$D = 0.933 \times [\text{wt}\%H_{\text{fuel}}] = 0.933 \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$E = B + C + D = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$F = 21 - [\text{vol}\%_{\text{dry}}O_{2,\text{exhaust}}] = 21 - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$G = [\text{vol}\%_{\text{dry}}O_{2,\text{exhaust}}] \div F = \underline{\hspace{2cm}} \div \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$H = 1 + G = 1 + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$I = E \times H = \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$\text{SO}_2 \text{ concentration} = A \div I = \underline{\hspace{2cm}} \div \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \text{ PPM}$$

The **wt%*S*_{fuel}**, **wt%*C*_{fuel}**, and **wt%*H*_{fuel}** are equal to the weight percents of sulfur, carbon, and hydrogen in the fuel. These percentages should total 100%.

The fuel weight percent (wt%) of sulfur is obtained pursuant to condition 6.2b. The fuel weight percents of carbon and hydrogen are obtained from the fuel refiner.

The volume percent of oxygen in the exhaust (**vol%*O*_{2,exhaust}**) is obtained from oxygen meters, manufacturer's data, or from the most recent ORSAT analysis at the same engine load used in the calculation.

Enter all of the data in percentages without dividing the percentages by 100. For example, if **wt%*S*_{fuel}** = 1.0%, then enter 1.0 into the equations not 0.01 and if **vol%*O*_{2,exhaust}** = 3.00%, then enter 3.00, not 0.03.

[18 AAC 50.350(g), 1/18/97]

Section 15. ADEC Notification Form

Fax this form to: (907) 269-7508 Telephone: (907) 269-8888

Anchorage Municipal Light & Power
Company Name**George M. Sullivan Generation Plant Two**
Facility Name**1. Reason for notification:**☐ **Excess Emission**☐ **Permit Condition Exceedance****2. Event Information (Use 24-hour clock):**

	START Time: (hr:min):	END Time:	Duration
Date: _____	_____	_____	_____
Date: _____	_____	_____	_____
		Total:	_____

3. Cause of Event (Check all that apply):☐ **START UP**☐ **UPSET CONDITION**☐ **CONTROL EQUIPMENT**☐ **SHUT DOWN**☐ **SCHEDULED MAINTENANCE**☐ **OTHER** _____

Attach a detailed description of what happened, including the parameters or operating conditions exceeded.

4. Sources Involved:

Identify each Emission Source involved in the event, using the same identification number and name as in the Permit. List any Control Device or Monitoring System affected by the event. Attach additional sheets as necessary.

Source ID No.	Source Name	Description	Control Device
_____	_____	_____	_____
_____	_____	_____	_____

5. Emission Limit and/or Permit Condition Exceeded:

Identify each Emission Standard and Permit Condition exceeded during the event. Attach a list of ALL known or suspected injuries or health impacts. Attach additional sheets as necessary.

Permit Condition	Limit	Exceedance
_____	_____	_____
_____	_____	_____

6. Emission Reduction:

Attach a detailed description of ALL of the measures taken to minimize and/or control emissions during the event.

7. Corrective Actions:

Attach a detailed description of ALL corrective actions taken to restore the system to normal operation.

Based on information and belief formed after reasonable inquiry, I certify that the statements and information in and attached to this document are true, accurate, and complete.

Printed Name: _____

Signature: _____

Date: _____

Alaska Department of Environmental Conservation

Air Permits Program

Issued: April 11, 2001

George M. Sullivan Generation Plant Two

Anchorage Municipal Light & Power

LEGAL AND FACTUAL BASIS

of the terms and conditions for

Permit No. 203TVP01

Revision 1: August 23, 2002

Administrative Revision: September 25, 2002

Prepared by Cynthia Espinoza

Revised by Albert Faure

INTRODUCTION

This document sets forth the legal and factual basis for the terms and conditions of Operating Permit No. 203TVP01, Revision 1.

The George M. Sullivan Generation Plant Two is a facility that provides electrical power to local markets via a high-voltage transmission and distribution system. The facility is owned and operated by Municipality of Anchorage, d/b/a Anchorage ML&P. Anchorage Municipal Light & Power is the permittee for the facility's operating permit.

PROCESS DESCRIPTION

As provided in the application, the facility contains three dual-fuel-fired turbine generator sets Source ID 1 GTG-5 (1975), Source ID 5 GTG-7 (1979), and Source ID 3 GTG-8 (1984); and one waste-heat steam generator STG-6 (1979). Additionally, the facility utilizes one diesel-fired internal combustion (IC) engine (black-start unit 5), two diesel IC engines (auxiliary generators), and miscellaneous support equipment. Also on site are warehouse facilities, a small analytical laboratory for water chemistry, shop buildings, cooling towers, chemical storage containers, and two tanks storing No. 1 diesel fuel.

The sources at the facility regulated in Operating Permit 203TVP01, Revision 1 are identified in TABLE 1 in Section 4 of the permit.

SOURCE INVENTORY AND DESCRIPTION

Section 4 of Operating Permit No. 203TVP01 Revision 1 contains TABLE 1 describing the sources regulated by the permit. The table is provided for information and identification purposes only. Specifically, the source rating/size provided in the table is not intended to create an enforceable limit.

EMISSIONS

Table 1. Emissions Summary

Pollutant	NO _x	CO	PM-10	SO ₂	VOC
Potential Emissions (TPY) per AS 46.14.990(21)	4,332	242.4	354.6	59	144
Assessable Potential to Emit (TPY) under condition 1.1.	4,332	242.4	354.6	59	144

The potential emissions were determined with the maximum rate capacity. The sources of the emission factors are manufacturer's estimate, source test data, or AP-42 (10/96). Emissions

factors were provided in the application and as is indicated in the preliminary construction permit 203CP01 dated May 30, 2002.

The assessable potential to emit is simply those regulated air contaminants for which the facility has the potential to emit quantities greater than 10 tons per year.

BASIS FOR REQUIRING AN OPERATING PERMIT

George M. Sullivan Generation Plant Two requires an operating permit because it has the potential to emit 100 tons per year (tpy) or more of a regulated air contaminant. George M. Sullivan Generation Plant Two meets the definition of operating permit facility in the state regulations at Section 2. George M. Sullivan Generation Plant Two is also a Prevention of Significant Deterioration (PSD) Major Facility as defined in 18 AAC 50.300(c)(1) because it has the potential to emit more than 250 tpy of a regulated air contaminant in an area classified as attainment or unclassifiable. George M. Sullivan Generation Plant Two has undergone a PSD review because the facility was modified after August 8, 1980, to exceed the PSD trigger levels in 18 AAC 50.300(h)(3)(B).

Alaska regulations require operating permit applications to include identification of “regulated sources.” As applied to George M. Sullivan Generation Plant Two, the state regulations require a description of:

- Each incinerator, including a demonstration showing each requirement in 18 AAC 50.050, Incinerator Emissions Standards, that applies [18 AAC 50.335(e)(4)(A)];
- Each source regulated by a standard in 18 AAC 50.055, Industrial Processes and Fuel Burning Equipment [18 AAC 50.335(e)(4)(C)];
- Each source subject to a standard adopted by reference in 18 AAC 50.040 [18 AAC 50.335(e)(2)]; and
- Sources subject to requirements in an existing DEC permit [18 AAC 50.335(e)(5)].

The emission sources at George M. Sullivan Generation Plant Two classified as “regulated sources” according to the above DEC regulations are listed in TABLE 1 of Permit No. 203TVP01, Revision 1.

CURRENT AIR QUALITY PERMITS

Previous Air Quality Permit to Operate

The gas turbine generator Source ID 3 (GTG-8) was reviewed under the Prevention of Significant Deterioration provisions of 18 AAC 50 and issued a PSD permit on October 15, 1984, Permit No. 8421-AA004. This permit specified limits for nitrogen oxides (94 ppmv @ 15% O₂ dry basis), particulate matter (10% opacity), and sulfur dioxide (distillate fuel 0.01% by weight).

The department issued renewal Permit No. 9421-AA014 on April 4, 1995, allowing George M. Sullivan Generation Plant Two the use of distillate fuel with a sulfur content of 0.1% by weight in Source ID 3. This modification would result in an increase of emissions of 18.3 tons per year of sulfur dioxide, which is less than the PSD applicability thresholds given in 18 AAC 50.300(a)(6)(C)(iii) & (iv).

Also, the department modified the permit to accommodate low load spinning reserve operation of Source ID 3 by increasing allowable carbon monoxide emissions by 98.6 tons per year, which would result in an increase of emissions less than the PSD applicability thresholds given in 18 AAC 50.300(a)(6)(C)(i)

Table 2 shows the emission increase due to the permit modifications in 1995. The emissions are expressed as tons per year, and must be included when determining the applicability of 18 AAC 50.300(a)(5-7) to any future emission increases at the facility.

Table 2. Emission Bank Account used to determine the applicability of 18 AAC 50.300(a)(5-7) for George M. Sullivan Generation Plant Two in TPY.

GTG-8	NO_x	CO	PM-10	VOC	Sox
1995 Changes	0	98.6	0.19	0	18.3
2002 Changes	1.0	88.6	0.1	0.2	18.3

Note: 2002 changes preliminary Construction Permit 203 CP 01 blackstart Unit and Source ID 3.

The most recent permit issued for this facility is permit-to-operate number Control Permit to Operate No. 9421-AA014. This permit-to-operate include all construction authorizations issued through October 7, 1996; and was issued before January 18, 1997. All facility-specific requirements established in this previous permit are included in the new operating permit as described in Table 3.

Construction Permits

A preliminary decision has been made to issue the Construction Permit No. 203CP01 for replacement of the Blackstart Unit 5 (Source ID 5).

Title-V Operating Permit Application History

The owner or operator submitted an application on December 2, 1997.

The owner or operator amended this application on January 30, 1998.

The application was substantially complete on January 30, 1998.

Additional information was received after the technical review in August 2000.

Additional ex parte information was received on December 11, 2000.

The Terms and Conditions of the Preliminary Construction Permit, for replacement the blackstart Unit 5, No. 203CP01 are incorporated in the Operating Permit 203TVP01 Revision 1.

COMPLIANCE HISTORY

The facility has operated at its current location since 1975. Review of the permit files for this facility, which includes the past inspection reports indicate a facility generally operating in compliance with its operating permit.

FACILITY-SPECIFIC REQUIREMENTS CARRIED FORWARD

18 AAC 50.350(d)(1)(D) requires that this permit include each facility specific requirement established in prior permit Control Permit to Operate No. 9421-AA014. Table 3 below lists the old requirement (condition) and the new condition that carries over the old requirement into the new permit.

Table 3. A comparison of pre-January 18, 1997 Permit to Operate No. 9421-AA014. Facility-specific conditions to Permit No. 203TVP01 conditions. This table does not include standard and general conditions.

Permit No. Control Permit to Operate No. 9421-AA014 Condition	Description of Requirement	Permit No. 203TVP01 condition	How condition was revised
2	Source ID 3 shall not exceed 94 ppmvd NO _x @ 15% oxygen	13	same information, different format
2	PM limit, Source ID 3 shall not exceed opacity >10% for more than 3 minutes	29	same information, different format
5	Source ID 3 shall use water injection if burning diesel fuel	21	same information, different format
6	Source ID 3 shall not use diesel fuel	28.6	Turbine diesel fuel system ID 3 is disconnected. No diesel use

Permit No. Control Permit to Operate No. 9421-AA014 Condition	Description of Requirement	Permit No. 203TVP01 condition	How condition was revised
			possible. Authorize combustion of only fuel gas.
7	Shall not burn fuel with sulfur content > 0.10% in Source ID 3	6.1	same information, different format
8	Used turbine oil burning condition	31	Replaced with a prohibition
18	Report excess emissions within 5 working days	57	Report excess emissions within 48 hours
22	Source ID 3 shall not exceed 185 tons/12-month period of CO	28	Per 12 month rolling period source ID 3 shall not exceed 185 tons per 12 months rolling period.
22	Source test fuel gas to derive specific fuel emissions factor for CO ID 3.	29	Derive with source test ID 3 the fuel specific emissions rate. Use the greater of the correlation of source test results for each CO value.

LEGAL AND FACTUAL BASIS FOR THE PERMIT CONDITIONS

Conditions 1 - 2

Legal Basis: [18 AAC 50.350(c) & 18 AAC 50.400 – 420, 1/18/97]

The regulations require all permits to include due dates for the payment of fees and any method the permittee may use to re-compute assessable emissions.

Factual Basis: These conditions require the permittee to pay fees in accordance with the department's billing regulations. The department's billing regulations set the due dates for payment of fees based on the billing date.

The conditions also set forth how the permittee may recompute assessable emissions. If the permittee does not choose to annually calculate assessable emissions, emissions fees may be paid based on “potential to emit.”

The potential to emit for sulfur dioxide is based upon a 0.5% fuel sulfur limit as allowed in the permit.

Table 4. Potential to Emit [AS 46.14.990(21)] and Actual Emissions Estimate for George M. Sullivan Generation Plant Two in TPY.

1999-2000		Actual Emissions ¹					Potential Emissions ²				
	Source	NO _x	CO	PM-10	VOC	SO _x	NO _x	CO	PM-10	VOC	SO _x
	GTG-5 Gas Turbine Generator	566.1	20.7	1.88	16.6	3.19	1,329	49.4	7.21	38.5	11.9
	GTG-7 Gas Turbine Generator	1,012	2.07	98.7	49.3	12.3	1,383	7.95	135.1	66.1	27.1
	GTG-8 Gas Turbine Generator ³ *	120.7	3.34	64.9	37.2	7.92	1,620	185	212.3 ⁴	39.4	20
	Total	1699	26.1	165.5	103.1	23.4	4,332	242.4	354.6	144	59

Notes:

- Actual emissions were determined with actual operations from 7/99 – 6/00. The sources of the emission factors are manufacturer's estimate, source test data, or AP-42 (10/96).
- Potential emissions were determined with the maximum rate capacity. The sources of the emission factors are manufacturer's estimate, source test data, or AP-42 (10/96), and the following assumptions. Hours of operation 8,560 on natural gas and 200 hours of operation on diesel fuel for Sources GTG-5 and GTG-7.
- Potential emissions for Source GTG-8 are based on emission limitations representing the best available control technology (BACT). As set out in Operation Permit 203TVP01 Rev.1, The CO emissions for Source ID 3 is limited to max 185 tons per 12 month rolling period.
- Potential emissions based on 200.4 TPY from gas, and 11.96 TPY from liquid fuel for 2.82x10⁶ gal/yr. limit.

* Source ID 3 is the GTG 8 Gas Turbine

Condition 3

Legal Basis: [18 AAC 50.055(a)(1), 1/18/97 & 5/3/02]

[18 AAC 50.350(d), 6/21/98]

[18 AAC 50.350(g) – (i), 1/18/97]

Turbines are fuel-burning equipment. This regulation applies to operation of all fuel-burning equipment in Alaska.

Factual Basis: On May 30, 2002, the department adopted into regulation a new six-minute average standard for visible emissions. The original three-minute is still effective until the department submits, and EPA approves, a SIP change removing the three-minute standard. The condition cites the two state visible emission standards applicable to fuel-burning equipment. All fuel-burning equipment (Source IDs 1 – 3) is subject to the three minute standard, but only Source ID 5 is subject to the new six-minute standard because this is the only source that was added in construction permit 203CP01. The permittee shall not cause or allow the turbines to violate these standards.

The permittee is required to monitor in accordance with the state reference method. ML&P requested during the ex parte meeting on November 20, 2000 removal of the entire Smoke/No Smoke option and committed to performing Method 9 readings only.

The monitoring, recordkeeping, and reporting requirements for the three-minute aggregate standard are listed in Section 12 of the permit. The requirements for the visible emission and particulate matter standards are combined in this section.

The monitoring, recordkeeping, and reporting requirements for the six-minute average standard are listed in Section 12 of the permit.

The permittee must submit copies of the results of all observations done using the state reference test method with operating reports. The permittee must report emissions in excess of the state visible emission standard.

Condition 5

Legal Basis: [18 AAC 50.055(b)(1), 1/18/97]

[18 AAC 50.350(d), 6/21/98]

[18 AAC 50.350(g) – (i), 1/18/97]

Turbines are fuel-burning equipment. This regulation applies to operation of all fuel-burning equipment in the State of Alaska.

Factual Basis: The condition cites the state particulate-matter emission standard applicable to fuel-burning equipment. The permittee shall not cause or allow turbines to violate this standard.

The monitoring, recordkeeping, and reporting requirements are listed in Section 12 of the permit. The requirements for the visible emission and particulate matter standards are combined in this section.

The requirement to test for particulate matter to determine compliance with the standard is triggered by the results of observations conducted in accordance with the state reference test method. The permittee is required to conduct tests if the results of an observation show noncompliance with visible emission standard or the average opacity indicates noncompliance with the particulate matter standard.

The department is not requiring initial tests of the turbines, Source IDs 1 – 3, to show compliance with the particulate matter standards. Based on voluntary source testing of GTG-2 gas turbine in October 1999 from the Ship Creek Facility, the department believes the facility's turbines from G. Sullivan Facility comply with the particulate matter standard.

Also, there are opacity-particulate correlations from the October 1999 turbine source test that show emissions from the facility's turbines will meet the state standard of 0.05 grains per dry standard cubic foot if the average opacity in the exhaust is less than 20 percent. The source test for GTG-2 gas turbine showed a grain loading of ~ 0.01 grains per dry standard cubic foot at 20 percent opacity. The department believes this is sufficient justification to not require initial compliance testing since the permittee certified compliance with the visible emission standard in the application. However, the department is requiring testing if the permittee observes visible emissions greater than the state standard.

In a general operating permit for diesel engines, the department required source tests for particulate matter when the average opacity of a visible emission observation exceeded twelve percent. Since that time, the department has uncovered additional test data and literature that supports a statement that diesel engines will meet the 0.05 grain loading standard when the average opacity is less than twelve percent, provided that the exhaust outlet diameter (path length for opacity observations) exceeds 21 inches. Testing conducted at both an Alaskan power plant and an Hawaiian utility confirm that compliance with the 20 percent opacity standard will insure compliance with the 0.05 gr./dscf particulate standard, provided that the exhaust outlet is 21 inches or larger. This test data closely agrees with values obtained using the smoke density calculator at:

<http://www.dieselnet.com/calculator/index.html>.

The calculator is based on the report, *Particulate Matter Measurements*, DieselNet Technology Guide, Revision 1997.12. Based on this new information, the department is requiring testing if the permittee observes visible emissions greater than 12%, expressed as a six-minute average and the stack diameter if the source is less than 21 inches. The department is also requiring the permittee to measure visible emissions during a source test and to calculate the average opacity during the test.

The permittee must submit copies of all source test reports and emissions in excess of the particulate matter standard.

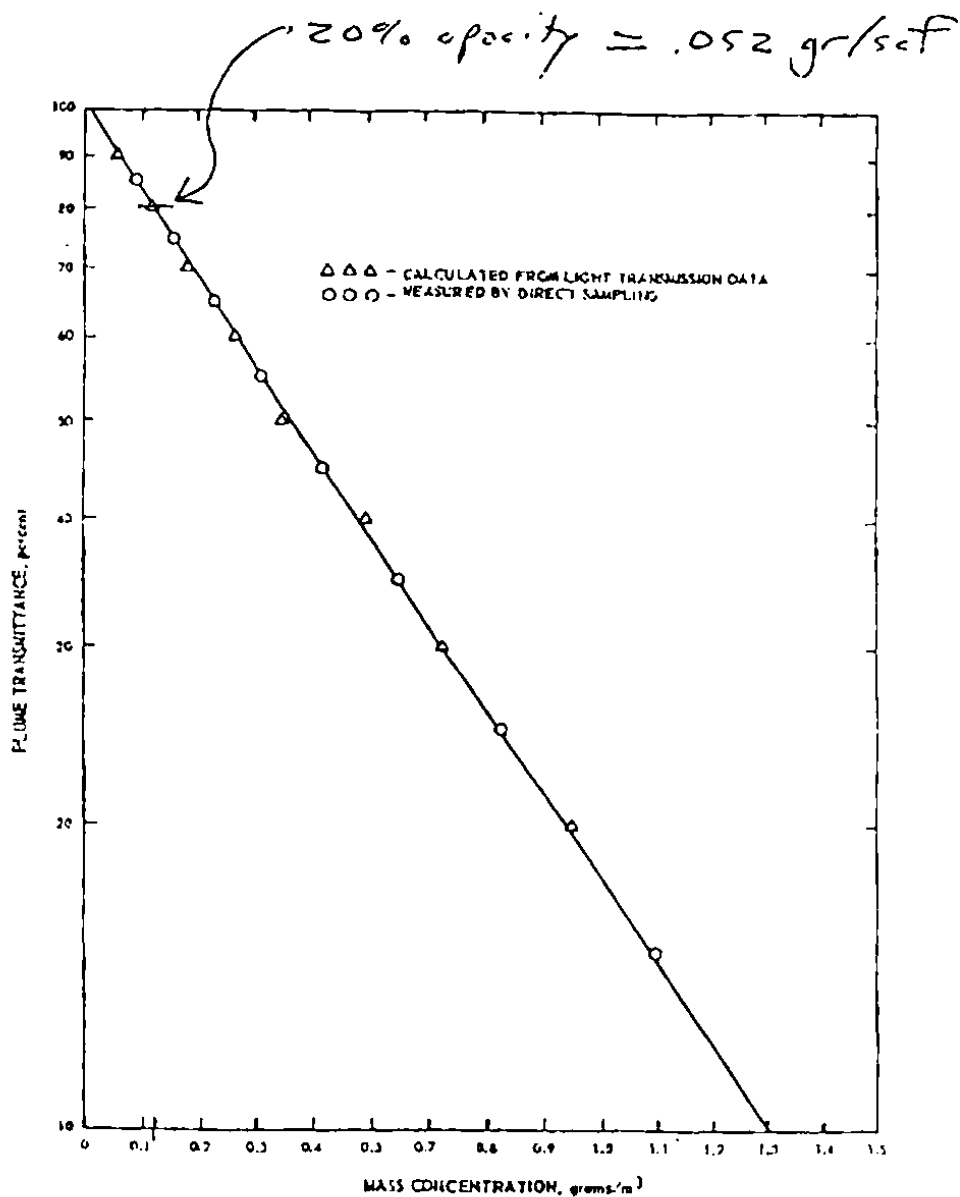


Figure 32. Mass concentration of black plume as calculated from transmittance and measured by direct sampling.

OPTICAL PROPERTIES AND VISUAL EFFECTS

Condition 6

Legal Basis: [18 AAC 50.055(c), 1/18/97]
[18 AAC 50.350(d), 6/21/98]
[18 AAC 50.350(g) – (i), 1/18/97]

The condition applies to turbines because they are fuel-burning equipment.

Factual Basis: The condition re-iterates a sulfur emission standard applicable to fuel-burning equipment. The permittee may not cause or allow their equipment to violate this standard.

Diesel Fuel. Diesel fuel sulfur is measured as weight percent sulfur. Attachment 1 of this permit shows that fuel containing no more than 0.5% sulfur will always comply with the emission standard. This is true for all liquid hydrocarbon fuels, even with no excess air. Verification of ASTM fuel grade as No. 1 or No. 2 fuel oil will certify compliance with the standard because these fuel oils always have a fuel sulfur content of no more than 0.5%. For fuels with a sulfur content higher than 0.5, this condition requires the permittee to use the equations in Section 14 to calculate the exhaust gas SO₂ concentration, showing whether the standard is exceeded. The equations in Attachment 1 and in Section 14 are all based on stoichiometric mass balance.

The permittee is required to burn fuel oil with a sulfur content of no more than 0.1% in Source ID 3, this is a BACT limit carried forward from Permit No. 9421-AA014.

Fuel Gas. Fuel gas sulfur is measured as hydrogen sulfide, i.e. H₂S concentration in ppm by volume. Attachment 2 of this permit shows that fuel gas containing no more than 4000 ppm H₂S will always comply with this emission standard. This is true for all fuel gases, even with no excess air. The equations in Attachment 2 are based on stoichiometric mass balance. Equations to calculate the exhaust gas SO₂ concentration resulting from the combustion of fuel gas were not included in this permit. Fuel gas with an H₂S concentration of even 10% of 4000 ppm is currently not available to this facility and is not projected to be available during the life of this permit. ML&P submitted ex parte comments on November 20, 2000 on the non-detect levels of hydrogen sulfide in pipeline quality gas.

Sulfur dioxide comes from the hydrogen sulfide in the fuel gas and from sulfur in the liquid, hydrocarbon fuel (e.g. diesel or No. 2 fuel oil). Typical pipeline quality gas analyses for the facility show less than 1 ppm H₂S. The gas supplier will provide an analysis to the permittee as the basis for the annual compliance certification.

Either fuel sulfur testing or verification of ASTM fuel grade will verify compliance.

Condition 7

Legal Basis: [18 AAC 50.040(a)(2)(M), 7/2/00]
[Federal Citation: 40 C.F.R. 60.110b(c), 7/1/99]
[Federal Citation: 40 C.F.R. 60.116b(a) – (b), 7/1/99]

Factual Basis: Source ID 4 was built or modified after July 23, 1984. The source has a storage capacity of 3,785 cubic meters. The source stores a volatile liquid with a maximum true vapor pressure of less than 3.5kPa. Therefore, the source is subject to 40 C.F.R. 60.116b(a) and (b). This permit condition requires the same records as 40 C.F.R. 60.116b(a) and (b).

Because the condition is a permanent record keeping condition, no monitoring or reporting is required.

Condition 8 – 12

Legal Basis: [18 AAC 50.040(a)(1), 7/2/00]

[Federal Citation 40 C.F.R. 60. Subpart A, 7/1/99]

Factual Basis: Conditions 8 - 12 require the maintenance of records of malfunctions of NSPS sources or pollution control or monitoring equipment. The conditions require that sources be operated in accordance with good air pollution control practices to minimize emissions. The conditions restate the federal credible evidence rule and the prohibition against the use of gaseous diluents to achieve compliance with an opacity standard. All of these requirements are from 40 C.F.R. 60 Subpart A.

Conditions 13 - 26

Legal Basis: [18 AAC 50.040(a)(1) & (2)(V), 7/2/00]

[40 CFR 60 Subpart A, GG and Appendices A, B, & F, 7/1/99]

Factual Basis: The U.S. Environmental Protection Agency (EPA) regulates New Source Performance Standards (NSPS). The intent of NSPS is to provide technology-based emission control standards. EPA may delegate to each state the authority to implement and enforce standards of performance for new stationary sources located in that state. The department has incorporated by reference the NSPS for specific industrial activities, as listed in 18 AAC 50.040. However, EPA has not delegated to the department the authority to administer the NSPS program at this time.

Turbines that are subject to Subpart GG for Stationary Gas Turbines are rated greater than 10.7 gigajoules per hour (10 MMBtu/hr), based on the lower heating value of fuel fired and constructed, modified, or reconstructed after October 3, 1977. An affected facility subject to an NSPS Subpart is also subject to Subpart A, General Provisions.

Condition 13

Legal Basis: [18 AAC 50.040(a)(2)(V), 7/2/00 and 18 AAC 350(g) – (i), 1/18/97]

[40 CFR 60.332, 7/1/99]

Factual Basis: Turbines are affected facilities as classified in 40 CFR 60.330, Subpart GG, Standards of Performance for Stationary Gas Turbines, if constructed, modified, or reconstructed after October 3, 1977 and have heat input ratings greater than 10.7 gigajoules heat input per hour based on lower heating value of the fuel. NSPS standards impose

additional emission limits on the affected facility's SO₂ and NO_x emissions. Condition 13 of the permit incorporates relevant portions of Subpart GG.

Standards for Nitrogen Oxides:

The turbines are subject to 40 CFR 60.332(a)(2) because they are classified under 40 CFR 60.330(b) as affected facilities with heat input loads greater than 10 MMBtu/hr (10.7 gigajoules/hr) and less than 100 MMBtu/hr (107.2 gigajoules/hr), and modified after October 3, 1982.

The NSPS NO_x standard under 40 CFR 60.332(a)(2) states that no owner or operator shall cause to be discharged into the atmosphere from any stationary gas turbine, any gases which contain nitrogen oxides in excess of:

$$\text{STD} = 0.0075 * \frac{14.4}{Y} + F$$

Where: STD = allowable NO_x emissions, percent by volume at 15% O₂ and on a dry basis.

Y = manufacturer's rated heat rate at manufacturer's rated peak load, kilojoules per watt hour, or actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the affected facility. The value of Y shall not exceed 14.4 kilojoules per watt-hour.

F = NO_x emission allowance for fuel-bound nitrogen, percent by volume, assumed to be zero for Alaskan fuels.

The worst-case limit for the turbines is 75 ppmvd at 15% O₂ (using a manufacturer's heat rate at a maximum of 14.4 kJ/W hr).

Alaska State regulation 18 AAC 50.350(g) requires state operating permits to contain sufficient periodic monitoring to determine compliance with each permit condition. NSPS GG imposes no periodic monitoring requirements for the NO_x standard, and it would be inappropriate to deem fuel nitrogen monitoring reporting alone to be periodic monitoring sufficient to determine compliance with that standard.

EXEMPTIONS FROM THE NO_x EMISSION LIMITS

Stationary gas turbines with a heat input at peak load greater than 107.2 gigajoules per hour that commenced construction, modification, or reconstruction between the dates of October 3, 1977, and January 27, 1982, and were required in the September 10, 1979,

Federal Register (44 FR 52792) to comply with condition 4, except electric utility stationary gas turbines, are exempt from condition 13.

Condition 14

Legal Basis: [18 AAC 50.335(g), 1/18/97]
[18 AAC 50.350(g)-(i), 1/18/97]
[18 AAC 50.220(a)-(c), 1/18/97]
[Federal Citation: 40 CFR 60.8, 7/1/99]
[18 AAC 50.040(a)(1), 7/2/00]

Factual Basis: Under 40 CFR 60, Subpart GG, Source ID 3 is subject to a nitrogen oxides emission limit of 94 ppmv. Source ID 3 is equipped with a Dry Low NO_x system, which lowers NO_x emissions at higher loads (NO_x typically increases with load in the absence of a low NO_x system).

In the Dry Low NO_x system there are four basic modes of operation, primary, lean-lean, secondary, and premix.

Source ID 3 is capable of operating in the lean-lean mode above turbine firing temperature signal. This mode is called "lean-lean extended." The consequence of operating in lean-lean extended is that the turbine exhaust emissions will approach 90% the NO_x limit.

ML&P provided ex parte certified information on November 20, 2000 that presents the approximate percentage of time that Source ID 3 is operated in each mode, along with the range of expected NO_x emissions for each mode. The operating times for each mode are based on the operating history of the unit and NO_x emissions are based on current source test data.

Based on 8,760 operating hours, ML&P expects that the unit will have NO_x emissions approaching 90% of the standard for only about 5% of the year.

Based on the above source-specific factors, source testing once during the permit term will provide reasonable assurance of compliance with the NO_x standard coupled with an owner requested limit, from the facility, of 75 megawatts power output.

ML&P shall maintain records indicating turbine load, operating mode, operating time, and date, once per hour for each hour that Source ID 3 operates. The records shall be documented in a written log and be available to the department upon request.

Conditions 15 - 16

Legal Basis: [18 AAC 50.040(a), 7/2/00 & 18 AAC 50.350 (g)-(i), 1/18/97]
[40 CFR 60, Subpart A, 7/1/99]

Factual Basis: Subpart A contains notification, monitoring, record keeping, and reporting requirements. These conditions detail the initial source testing requirements for turbines under this permit.

Conditions 17 - 19

Legal Basis: [18 AAC 50.040(a)(2)(V), 7/2/00]
[40 CFR 60.333 & 40 CFR 60.334(a)(2), 7/1/99]
[40 CFR 60.8, 7/1/99]

Factual Basis: Affected turbines are subject to the SO₂ standards as stated in 40 CFR 60.333. The owner or operator shall not discharge gases into the atmosphere from a stationary gas turbine with SO₂ in excess of 0.015% by volume (150 ppmvd) at 15% O₂ and on a dry basis, or no owner or operator shall burn fuel with greater than 0.8% sulfur by weight.

Permit condition 18 sets the frequency of fuel sulfur and nitrogen determinations. It incorporates the applicant's fuel sulfur limit with NSPS monitoring, reporting, and testing requirements.

The permittee shall maintain records of all sulfur monitoring data for five years as set out in 18 AAC 50.350(h)(5). The applicant shall maintain records documenting the fuel supplier or source. A substantive change in fuel quality shall be considered as a change in fuel supply.

The permittee shall determine compliance with the sulfur dioxide standard per 40 CFR 60.335(d). The permittee shall use methods described in this section—ASTM D 1072-80, D3031-81, D4084-82, or D3246-81, or EPA-approved alternative. The applicant may use fuel analysis performed by owner/operator, service contractor, fuel vendor, or other qualified agency pursuant to 60.335(f).

Condition 19 incorporates the EPA approved alternative monitoring plan and the alternative fuel H₂S monitoring method by using the length-of-stain detector tubes which is covered by ASTM method D4810-88.

The conditions incorporate Federal test methods by reference.

Condition 20

Legal Basis: [18 AAC 50.040(a)(2)(V), 7/2/00 & 18 AAC 50.350(i), 1/18/97]

Factual Basis: Condition 20 requires the permittee to report excess emissions.

Conditions 21 - 24

Legal Basis: [18 AAC 50.040(a)(2)(V), 7/2/00 & 18 AAC 50.350(g)-(i), 1/18/97]
[40 CFR 60.334(c) & 60 335 (c), 7/1/99]

Factual Basis: The water-to-fuel ratios identified in condition 24 have determined to result in optimum reduction in emissions. Therefore, ML&P will operate the water injection system at these ratios.

These conditions require the permittee to monitor and record operating parameters relating to water injection for NO_x emission control. Condition 23 cites the emission testing methods.

Conditions 25 - 26

Legal Basis: [18 AAC 50.040(a)(2)(V), 7/2/00 & 18 AAC 50.350(g)-(i), 1/18/97]

[40 CFR 60.7, 60.11 & 60.12, 7/1/99]

Factual Basis: Condition 25 describes exactly what is required to be in an excess emission report and condition 26 requires the permittee to submit an operating report for each listed turbine.

Conditions 27- 30

Legal Basis: [18 AAC 50.350(d)(1)(D), 1/18/97]

[Operating Permit No. 9421-AA014, 4/4/95]

[18 AAC 50.350(g) – (i), 1/18/97]

Factual Basis: These conditions set out the requirements for PSD Avoidance. These requirements were contained in the Operating Permit 8421-AA004 issued on October 15, 1984 and carried forward to Operating Permit 9421-AA014 issued on April 4, 1995. The department has prepared a preliminary Construction Permit No. 203CP01 May 30, 2002. The terms and conditions of the preliminary Construction Permit are incorporated in the Operating Permit No. 203 TVP01, Revision 1

Condition 31

Legal Basis: [18 AAC 50.030, 1/1/00 & 18 AAC 50.055(b)(1), 1/18/97]

[18 AAC 50.110, 5/26/72]

[18 AAC 50.350(g) – (i), 1/18/97]

Factual Basis: This condition prohibits the burning of off-site generated used-oil.

Staff experience indicates that burning used oil by itself may violate 18 AAC 50.055(b).

The department received additional information from ML&P that burning a blend of approximately five percent used turbine oil in Source IDs 1-3, from changing out the turbine oil in Source IDs 1–3, will comply with 18 AAC 50.055(b)(1) and 18 AAC 50.110. The department may request used-oil blending records.

Conditions 32 - 34

Legal Basis: [18 AAC 50.050(a)(2), 1/18/97]

[18 AAC 50.055(a)(1), 1/18/97]

[18 AAC 50.055(b)(1), 1/18/97]

[18 AAC 50.055(c), 1/18/97]

Factual Basis: These are general emission standards which apply to all industrial processes fuel-burning equipment, and incinerators regardless of size. The conditions reiterate the

general standards and require compliance for insignificant sources. The permittee may not cause or allow their equipment to violate these standards. Insignificant sources are not listed in the permit unless specific monitoring, record keeping and reporting are necessary to ensure compliance.

The department finds that the insignificant sources at this facility do not need specific monitoring, record keeping and reporting to ensure compliance.

Condition 35

Legal Basis: [18 AAC 50.350(m)(3), 9/4/98]

Factual Basis: The regulations require the permittee to certify that their insignificant sources comply with applicable requirements. The condition restates the regulatory requirement.

Condition 36

Legal Basis: [18 AAC 50.040(b)(3) & 18 AAC 50.350(d)(1), 1/18/97]

[Federal Citation: 40 C.F.R. 61, Subpart M, 12/19/96]

If the permittee engages in asbestos demolition and renovation, then these requirements may apply.

Factual Basis: The condition cites and requires compliance with the regulations that will apply if the permittee engages in asbestos demolition or renovation. Because these regulations include adequate monitoring and reporting requirements and because the permittee is not currently engaged in such activity, simply citing the regulatory requirements is sufficient.

Condition 37

Legal Basis: [18 AAC 50.040(d) & 18 AAC 50.350(d)(1), 1/18/97]

[Federal Citation: 40 C.F.R. 82, Subpart F, 7/1/97]

Factual Basis: The condition cites and requires compliance with the regulations that will apply if the permittee uses certain refrigerants. Because these regulations include adequate monitoring and reporting requirements and because the permittee is not currently engaged in such activity, simply citing the regulatory requirements is sufficient.

Condition 38

Legal Basis [18 AAC 50.040(a) & (c), 7/2/00]

[18 AAC 50.040(b), 1/18/97]

[40 C.F.R. 60, 7/1/99]

[40 C.F.R. 61, 12/19/96]

[40 C.F.R. 63, 7/1/99]

Factual Basis: This condition cites and requires compliance with the regulations that will apply if the permittee engages in any activity subject to any 40 CFR 60, 40 CFR 61, or 40 CFR 63 regulation.

Condition 39

Legal Basis: [18 AAC 50.045(a), 1/18/97]
[18 AAC 50.350(f)(3), 1/18/97]
[18 AAC 350(g) – (i), 1/18/97]

Applies to the permittee because the permittee must comply with emission standards in 18 AAC 50.

Factual Basis: The requirement prohibits diluting emissions as a means of compliance. In practical terms, dilution only affects compliance when the emissions are being measured. Therefore, the monitoring is limited to immediately before source testing and once a year for exhaust that is continuously monitored.

Dilution can occur by design or by leaks in the exhaust ductwork. Intentional dilution is not expected to be a problem, as it would increase operating costs by increasing induced draft fan power requirements. Careful review of source test plans and operating conditions will prevent intentional dilution. Therefore, only leaks need to be monitored under this condition.

The monitoring adequately prevents dilution by requiring leaks to be repaired before compliance with the emission standards is measured.

Condition 40

Legal Basis: [18 AAC 50.055(g) & 18 AAC 50.310(m), 1/18/97]

Applies to the facility because the facility contains a stack or source modified after November 1, 1982.

Factual Basis: The condition restates the prohibition on stack injection (i.e., disposing of material by injecting it into a stack). No specific monitoring for this condition is practical. Compliance is ensured by inspections, because the source or stack would need to be modified to accommodate stack injection.

Condition 41

Legal Basis: [18 AAC 50.350(f)(4), 1/18/97]

This condition prohibits open burning at the facility.

Factual Basis: The permittee requested this prohibition which the department granted.

Condition 42

Legal Basis: [18 AAC 50.040(e), 7/2/00]
[18 AAC 50.110, 5/26/72]

[18 AAC 50.240(c), 1/18/97]

[18 AAC 50.350(d)(1), 1/18/97]

[18 AAC 50.350(g) – (i), 1/18/97]

Applies to the facility because the facility will have emissions.

Factual Basis: The condition restates the general prohibition on injurious air emissions, which applies to any emissions from the facility. While the other permit conditions and emissions limitation should ensure compliance with this condition, unforeseen emission impacts can violate this standard. These violations would go undetected except for complaints from affected persons. Therefore, to monitor compliance, the permittee must monitor and respond to complaints.

The permittee is to report any complaints and injurious emissions. The plant does not handle any large quantities of hazardous air pollutants. The permittee must keep records of the date, time, and nature of all complaints received and summary of the investigation and corrective actions undertaken for these complaints and to submit copies of these records upon request of the department.

Condition 43

Legal Basis: [18 AAC 50.235(a) & 18 AAC 50.350(f), 1/18/97]

Applies to the facility because the facility contains equipment subject to a technology-based emission standard.

Factual Basis: This condition restates a regulation that requires the permittee to take reasonable steps to minimize emissions if certain activity causes an exceedance of a technology-based emission standard. Because the technology-based emission standard itself is a condition of the permit, the permittee will report the excess emissions under condition 57. Because the excess emission report requires information on the steps taken to minimize emissions, this report is adequate monitoring for compliance with this condition.

Condition 44

Legal Basis: [18 AAC 50.335(a), 1/18/97]

Applies if the permittee intends to renew the permit.

Factual Basis: The condition restates the regulatory deadlines, citing the specific dates applicable to the facility. Submittal of the renewal application is sufficient monitoring, record keeping, and reporting.

Condition 45

Legal Basis: [18 AAC 50.220(a) & 18 AAC 50.345(a)(10), 1/18/97]

Standard condition to be included in all permits.

Factual Basis: Condition requires the permittee to conduct source tests as requested by the department, therefore no monitoring is needed. Conducting the requested source test is its own monitoring.

Conditions 46 - 48

Legal Basis: [18 AAC 50.030, 1/1/00]
[18 AAC 50.035, 7/2/00]
[18 AAC 50.040, 7/2/00]
[18 AAC 50.220(b) – (c), 1/18/97]
[18 AAC 50.350(g), 1/18/97]
[18 AAC 50.990(88), 1/18/97]
[Federal Citation: 40 C.F.R. 51, Appendix M, 7/1/97]
[Federal Citation: 40 C.F.R. 60, 40 C.F.R. 61, 40 C.F.R. 63, 7/1/99]

Applies when the permittee is required to conduct a source test.

Factual Basis: These conditions restate regulatory requirements for source testing. As such, they supplement the specific monitoring requirements stated elsewhere in this permit. The test reports required by later conditions adequately monitor compliance with these conditions, therefore no specific monitoring, reporting, or record keeping is needed.

Conditions 49 - 51

Legal Basis: [18 AAC 50.345(a)(10), 1/18/97]
[18 AAC 50.350(b)(3), 1/18/97]
[18 AAC 50.350(g) – (i), 1/18/97]

Applies when the permittee is required to conduct a source test.

Factual Basis: Standard condition 18 AAC 50.345(a)(10) is incorporated through these three conditions. Because this standard condition supplements specific monitoring requirements stated elsewhere in this permit, no monitoring, reporting, or record keeping is required. The source test itself is adequate to monitor compliance with this condition. A summary of the source test results, which must include the potential to emit in tons/yr. of the major regulated air contaminants, is acceptable pending the receipt of the entire report by the department.

Condition 52

Legal Basis: [18 AAC 50.220(f) & 18 AAC 50.350(g), 1/18/97]

Applies when the permittee tests for compliance with the particulate matter standard.

Factual Basis: The condition incorporates a regulatory requirement for particulate matter source tests. The permittee must use a certain equation to calculate the particulate-matter emission concentration from the source test results. Because this condition supplements specific monitoring requirements stated elsewhere in this permit, no monitoring, reporting, or record keeping is required.

Condition 53

Legal Basis: [18 AAC 50.205, 1/18/97]

[18 AAC 50.345(a)(9), 1/18/97]

[18 AAC 50.350(b)(3), 1/18/97]

[18 AAC 50.350(i), 1/18/97]

Applies because the permit requires the permittee to submit reports, and because the condition is a standard condition.

Factual Basis: This condition restates the regulatory requirement that all reports must be certified. To ease the certification burden, the condition allows the excess emission reports to be certified with the semi-annual operating report, although the excess emission reports must be submitted more frequently. This condition supplements the reporting requirements of the permit and no monitoring, record keeping, or reporting for this condition is needed.

Condition 54

Legal Basis: [18 AAC 50.350(i), 1/18/97]

Applies because the permittee is required to send reports to the department.

Factual Basis: This condition merely specifies where submittals to the department should be sent. Receipt of the submittal at the correct department office is sufficient monitoring for this condition. This condition supplements the reporting requirements of the permit and no monitoring, record keeping, or reporting for this condition is needed.

Condition 55

Legal Basis: [18 AAC 50.200, 1/18/97]
[18 AAC 50.345(a)(8), 1/18/97]
[18 AAC 50.350(b)(3), 1/18/97]
[18 AAC 50.350(g) – (i), 1/18/97]

Applies to all permittees, and incorporates a standard condition

Factual Basis: Incorporates a standard condition in regulation, which tells the permittee to submit information requested by the department. Receipt of the requested information is adequate monitoring.

Condition 56

Legal Basis: [18 AAC 50.350(h), 1/18/97]

Applies to records required by a permit.

Factual Basis: The condition restates the regulatory requirements for record keeping, and supplements the record keeping defined for specific conditions in the permit. The records being kept provide adequate evidence of compliance with this requirement, therefore, no additional monitoring, record keeping, or reporting is required.

Condition 57

Legal Basis: [18 AAC 50.235(a)(2), 18 AAC 50.240(c) & 18 AAC 50.350(i), 1/18/97]

Applies when the emissions or operations deviate from the requirements of the permit.

Factual Basis: This condition satisfies two regulatory requirements related to excess emissions—the technology-based emission standard regulation and the excess emission regulation. Although there are some differences between the regulations, the condition satisfies the requirements of each regulation.

The condition does not mandate the use of the department's reporting form, but it does specify that the information listed on the form must be included in the report.

The reports themselves and the other monitoring records required under this permit provide an adequate monitoring of whether the permittee has complied with the condition. Therefore, no additional monitoring, record keeping, or reporting is required.

Condition 58

Legal Basis: [18 AAC 50.040, 7/2/00 & 18 AAC 50.350(i)(2), 1/18/97]

[Federal Citation: 40 C.F.R. 60 & 40 C.F.R. 61, 7/1/99]

Applies to facilities subject to NSPS and NESHAP federal regulations.

Factual Basis: The condition supplements the specific reporting requirements in 0 C.F.R. 60 and 40 C.F.R. 61. The permit does not need any monitoring, record keeping, or reporting. The reports themselves are adequate monitoring for compliance with this condition.

Condition 59

Legal Basis: [18 AAC 50.350(d)(4), 1/18/97]
[18 AAC 50.350(f)(3), 1/18/97]
[18 AAC 50.350(i), 1/18/97]
Applies to all permits.

Factual Basis: The condition restates the requirements for reports listed in regulation. The condition supplements the specific reporting requirements elsewhere in the permit and does not need any monitoring, record keeping, or reporting. The reports themselves are adequate monitoring for compliance with this condition.

Condition 60

Legal Basis: [18 AAC 50.350(j), 1/18/97]
[18 AAC 50.350(d)(4), 1/18/97]
Applies to all permittees.

Factual Basis: This condition specifies the periodic compliance certification requirements, and specifies a due date for the annual compliance certification. Because this requirement is a report, no monitoring, record keeping, or reporting is needed.

Condition 61

Legal Basis: [18 AAC 50.350(f)(3), 1/18/97]
[Federal Citation: 40 C.F.R. 52.12(c), 7/1/99]
Applies to all federally approved permits.

Factual Basis: This condition clarifies that any credible evidence can be used to verify compliance with the permit, not just the monitoring required under the permit. This condition is necessary to ensure compliance with the Clean Air Act. No monitoring, record keeping, or reporting is necessary for this condition.

Conditions 62 - 68

Legal Basis: [18 AAC 50.345(a)(1) – (7) & 18 AAC 50.350(b)(3), 1/18/97]
Applies to all operating permits.

Factual Basis: These are standard conditions required for all operating permits.

Condition 69 - 71

Legal Basis: [18 AAC 50.350(l), 1/18/97]

Applies because the permittee has requested a shield for the applicable requirements listed under this condition.

Factual Basis: The following table explains the permit shield requests and the department's applicability determination. The permit conditions sets forth the requirements that the department determined were not applicable to the facility, based on the permit application, past operating permit, construction permits and inspection reports.

Table 5. Permit Shield Decision

Shield requested for:	Shielded?	Reason for shield decision
40 C.F.R. 60 Subparts K, Ka – Source ID 4	Yes	Under 40 C.F.R 60.110b(c), all tanks greater than 151 cubic meters storing liquids with a vapor pressure less than 3.5 kPa are exempt from this Subpart, except for the requirements of 40 C.F.R 60.116b(b).
40 C.F.R. 60 Subpart GG – Source IDs 1-2	Yes	Sources were installed before October 7, 1977 and have not been reconstructed or modified.
40 C.F.R. 63	Yes	Applicable activities are not performed at the facility.

Many of the other requested shields are not needed because the permit shield is not intended to cover laws and regulations where it simply is not reasonable for any one to conclude that the permittee may be subject to those requirements.

Conditions 72 - 77

Legal Basis: [18 AAC 50.350(g) – (i), 1/18/97]

Applies because these conditions detail the monitoring, record keeping, and reporting required in conditions 3 and 5.

Factual Basis: Each permit term and condition must include monitoring, record keeping, and reporting for the permittee to show verifiable compliance with each permit term and condition.

The department modified the draft permit visible emissions evaluation procedures based on ML&P's ex parte comments during a meeting on November 20, 2000. ML&P requested during the ex parte meeting removal of the entire Smoke/No Smoke option and committed to performing Method 9 readings only.

Conditions not included in this Permit

Burning Used Oil—Public Comment Draft Conditions 33 and 34 were replaced with Condition 31 containing a prohibition against burning used oil generated off-site.

Bulk Materials Handling—Public Comment Draft Condition 43 was eliminated since ML&P submitted ex parte comments on November 20, 2000 that the facility is completely paved and this comment was the basis for deleting condition 43.

ATTACHMENT 1

MEMORANDUM

State of Alaska

**Department of Environmental Conservation
Division of Air and Water Quality - Air Quality Maintenance**

TO: John Stone, Chief

DATE: March 24, 1998

FILE: 74.05.02

FROM: John Kuterbach
Air Quality Maintenance

SUBJECT: Maximum SO₂ Concentration
from the combustion of #2
diesel fuel

EPA in their Title V permit reviews is requiring the department to demonstrate that limiting fuel sulfur to 0.5% will ensure compliance with our 500 ppmv SO₂ limit. This memorandum sets forth engineering calculations which demonstrate that combustion of #2 diesel fuel containing up to 0.5% sulfur will always comply with the 500 ppmv SO₂ limit regardless of the engine involved. I recommend that we reference these calculations in future "statements of basis" that we send to EPA with our draft operating permits.

Summary

This engineering calculation examined the stoichiometric combustion of #2 diesel fuel and calculated the maximum sulfur dioxide content of the flue gases. Typically, combustion of #2 diesel fuel can produce up to 338 ppmv SO₂ in the flue gas. Although this figure varies proportionally with the carbon content of the diesel fuel, the figure will never exceed the 500ppm limit.

I conclude that combustion of #2 diesel fuel with air will always comply with the 500ppmv emission limit. The ASTM specification for #2 diesel fuel limits sulfur to 0.5% or less.

Assumptions

All constituents of the fuel are burned proportionally

Any excess air typical of combustion would tend to dilute the SO₂ concentration in the flue gas, therefore only theoretical air is considered.

#2 diesel fuel is composed of Carbon, Hydrogen, Sulfur, and negligible amounts of Water and ash.

Ignore the water because the standard is a dry standard and the water will drop out of any calculations.

Ignore the ash as negligible unless the study predicts an SO₂ concentration greater than 450 ppm.

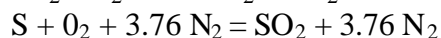
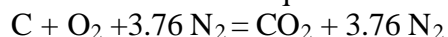
Typical #2 diesel fuel is composed of 87% Carbon, 12.5% Hydrogen, and 0.5% Sulfur

Calculations.

Using normal air for combustion (79% N₂ and 21% O₂):

For each lb-mole of Oxygen in Air, there is 3.76 lb-mole Nitrogen (1 lb-mole O₂) = (0.79/0.21) = 3.76 lb-mole N₂

The stoichiometric equations are:



To calculate the dry exhaust gases (CO₂, N₂, SO₂) the following equations are used:

$$\text{moles CO}_2 = (\text{lb C}) \times (1 \text{ lb-mole C}/12.01 \text{ lb C}) \times (1 \text{ lb-mole CO}_2/1 \text{ lb mole C})$$

$$\text{moles N}_2 = (\text{lb C}) \times (1 \text{ lb-mole C}/12.01 \text{ lb C}) \times (3.76 \text{ lb-mole N}_2/\text{lb-mole C})$$

$$+ (\text{lb H}_2) \times (1 \text{ lb-mole H}_2/2.016 \text{ lb H}_2) \times (3.76 \text{ lb-mole N}_2/2 \text{ lb-mole H}_2)$$

$$+ (\text{lb S}) \times (1 \text{ lb-mole S}/32.06 \text{ lb S}) \times (3.76 \text{ lb-mole N}_2/\text{lb-mole S})$$

$$\text{moles SO}_2 = + (\text{lb S}) \times (1 \text{ lb-mole S}/32.06 \text{ lb S}) \times (\text{lb-mole SO}_2/1 \text{ lb-mole S})$$

Condensing these equations leaves:

$$\text{moles CO}_2 = \text{lb C}/12.01$$

$$\text{moles N}_2 = 3.76 \times [(\text{lb C}/12.01) + (\text{lb H}_2/4.032) + (\text{lb S}/32.06)]$$

$$\text{moles SO}_2 = \text{lb S}/32.06$$

Then, by Avogadro's Law and the definition of mole:

$$\text{ppmv SO}_2 = 1,000,000 \times [\text{moles SO}_2/(\text{moles CO}_2 + \text{moles N}_2 + \text{moles SO}_2)]$$

Results

Using 100 pounds of fuel as a basis, we examined the following three cases:

Case	Pounds in Fuel		
	Carbon	Hydrogen	Sulfur
1	87	12.5	0.5
2	96	3.5	0.5
3	78	21.5	0.5

Case 1 is the normal case, Case 2 increases carbon by 10 percent, and Case 3 decreases carbon by 10 percent.

	Case 1	Case 2	Case 3
moles CO ₂	7.24	7.99	6.49
moles N ₂	38.94	33.36	44.51
moles SO ₂	0.0156	0.0156	0.0156
Total Dry Moles	46.196	41.366	51.016
ppmv SO ₂	338	377	306

Conclusion

The above calculations show that #2 diesel fuel combusted with air will always comply with the 500 ppmv SO₂ limit. The calculations use the conservative assumptions of complete combustion and no excess air. The real-world includes partial combustion and excess air, both of which would tend to dilute the SO₂ concentration in the exhaust effluent.

The equations above can be used as an initial screening for other petroleum fuels even with a higher sulfur content or significant ash.

If you agree this memorandum has value, please share it with the rest of the AQM staff.

Attachment 2

MEMORANDUM

State of Alaska

**Department of Environmental Conservation
Division of Air and Water Quality - Air Quality Maintenance**

TO: John F. Kuterbach, Program Manager

DATE: October 27, 2000

THRU: Bill MacClarence, Operating Permits Supervisor

FROM: Matt Wilkinson
Air Quality Maintenance

SUBJECT: Maximum SO₂ Concentration
from the combustion of natural
gas

EPA in their Title V permit reviews is requiring the department to demonstrate that limiting hydrogen sulfide content of the natural gas to 4000 ppmv will ensure compliance with our 500 ppmv SO₂ limit. This memorandum sets forth engineering calculations which demonstrate that combustion of natural gas containing hydrogen sulfide up to 4000 ppmv will always comply with the 500 ppmv SO₂ limit regardless of the source involved. I recommend that we reference these calculations in future "statements of basis" that we send to EPA with our draft operating permits.

Summary

This engineering calculation examined the stoichiometric combustion of natural gas and calculated the maximum sulfur dioxide content of the flue gases. The maximum sulfur dioxide concentration will result from the combustion of pure methane, whereas heavier hydrocarbons (e.g. ethane or propane) with the same volumetric hydrogen sulfide concentration will result in a lower concentration of sulfur dioxide. Typically, combustion of 4000-ppmv-hydrogen sulfide natural gas can produce up to 470 ppmv SO₂ in the flue gas and will never exceed the 500ppm limit.

I conclude that combustion of 4000-ppmv-hydrogen-sulfide natural gas with air will always comply with the 500ppmv emission limit.

Assumptions

All constituents of the fuel are burned proportionally.

Any excess air typical of combustion would tend to dilute the SO₂ concentration of the flue gas, therefore only theoretical air is considered.

Natural gas is composed of carbon, hydrogen, sulfur, and negligible amounts of water and ash.

Ignore the water because the standard is a dry standard and the water will drop out of any calculations.

The heavier hydrocarbons have a higher weight percent of hydrocarbons for a given volumetric hydrogen sulfide concentration that dilutes the SO₂ concentration of the flue gas, therefore the natural gas is entirely made up of methane—the lightest hydrocarbon.

By Dalton's Law and by the Ideal Gas Law, the molar fraction is equal to the volume fraction. Therefore, for 100 moles of 4000-ppmv-hydrogen sulfide natural gas there are $100 \times (4,000 / 1,000,000) = 0.4$ moles of hydrogen sulfide and there are $100 - 0.4 = 99.6$ moles of hydrocarbons.

By definition, the formula showing the composition of hydrocarbons is C_mH_n. Each mole of hydrocarbon supplies "m" moles C and supplies "n"/2 moles H₂. Each mole of hydrogen sulfide supplies one mole S and one mole H₂.

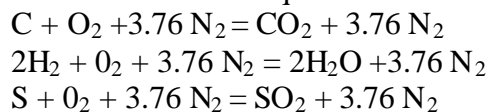
Therefore, the following equations can be used for 100 moles of a natural gas composed of 4000-ppmv hydrogen sulfide and only of one type of hydrocarbon:

$$\begin{aligned}\text{moles C} &= 99.6 \times m \\ \text{moles H}_2 &= (99.6 \times n / 2) + 0.4 \\ \text{moles S} &= 0.4\end{aligned}$$

Using normal air for combustion (79% N₂ and 21% O₂):

For each lb-mole of Oxygen in Air, there are 3.76 lb-mole Nitrogen ($1 \text{ lb-mole O}_2 = (0.79/0.21) = 3.76 \text{ lb-mole N}_2$)

The stoichiometric equations are:



To calculate the dry exhaust gases (CO₂, N₂, SO₂) the following equations are used:

$$\begin{aligned}\text{moles CO}_2 &= \text{moles C} \\ \text{moles N}_2 &= (3.76 \times \text{moles C}) + (1.88 \times \text{moles H}_2) + (3.76 \times \text{moles S}) \\ \text{moles SO}_2 &= \text{moles S}\end{aligned}$$

Then, by Avogadro's Law and the definition of mole:

$$\text{ppmv SO}_2 = 1,000,000 \times [\text{moles SO}_2 / (\text{moles CO}_2 + \text{moles N}_2 + \text{moles SO}_2)]$$

Results

Using 100 moles of fuel (i.e. 99.6 moles of hydrocarbon and 0.4 moles of hydrogen sulfide) as a basis, we examined the following three cases:

Case	Moles of Fuel		
	Carbon	Hydrogen	Sulfur
Methane = CH ₄	99.6	199.6	0.4
Ethane = C ₂ H ₆	199.2	299.2	0.4
Propane = C ₃ H ₈	298.8	398.8	0.4

	Methane	Ethane	Propane
moles CO ₂	99.6	199.2	298.8
moles N ₂	751.2	1313.0	1874.7
moles SO ₂	0.4	0.4	0.4
Total Dry Moles	851.2	1512.6	2173.9
ppmv SO ₂	470	264	184

Conclusion

The above calculations show that 4000-ppmv-hydrogen-sulfide natural gas combusted with air will always comply with the 500 ppmv SO₂ limit. The calculations use the conservative assumptions of complete combustion and no excess air. The real-world includes partial combustion and excess air, both of which would tend to dilute the SO₂ concentration in the exhaust effluent.

The equations above can be used as an initial screening for other gaseous petroleum fuels even with a higher hydrogen sulfide content.

If you agree this memorandum has value, please share it with the rest of the AQM staff.